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THE ROENTGEN UNIT IN DERMATOLOGY

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AND
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NEW YORK

The necessity for a unit of measurement of roentgen dosage was realized soon after roentgen rays were used therapeutically. The many methods and instruments that have been used for measuring the intensity and quality of radiation are well known. The most accurate method of measuring intensity is by the ionization of air, while spectrometry offers the most accurate means of measuring the quality of x-radiation.[1]

In 1908, Villard [2] described a unit of x-radiation based on the ionization of air. Additional units of x-radiation based on ionization have been described by Friedrich and Kroenig,[3] Duane,[4] Behnken [5] and Solomon.[6] In 1928 the international unit of radiation, the roentgen (r), was defined by the International X-Ray Unit Committee [7] and accepted by the International Congress of Radiology. The roentgen was defined as the quantity of x-radiation which when the secondary electrons are fully utilized and the wall effect of the chamber is avoided produces in 1 cc. of atmospheric air at 0 C. and 76 cm. of mercury pressure such a degree of conductivity that one electrostatic unit of charge is measured at saturation current. This unit is now internationally accepted.

Dosimeters of the thimble type calibrated in roentgens and designed to measure the quantity of roentgen rays by the ionization method in practical work were manufactured both here and abroad. These soon

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Read before the Section on Dermatology and Syphilology at the Eighty-Fifth Annual Session of the American Medical Association, Cleveland, June 13, 1934.

1. MacKee, G. M.: X-Rays and Radium in the Treatment of Diseases of the Skin, Philadelphia, Lea & Febiger, 1927.
2. Villard, J.: Arch. de l'électric. méd. **16**:692, 1908.
3. Friedrich, W., and Kroenig, B.: Strahlentherapie, supp. 3, 1918.
4. Duane, W.: The Scientific Basis of Short Wave-Length Therapy, Am. J. Roentgenol. **9**:781 (Dec.) 1922.
5. Behnken, H.: Ztschr. f. techn. Phys. **1**:3, 1924.
6. Solomon, I.: Bull. et mém. Soc. de radiol. méd. de France **10**:30, 1922.
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became popular because they offered a quick method for the direct measurement of roentgen intensities. Although we used the iontoquantimeters of Solomon, Wulf and others, most of our experiments were conducted with the Mekapion and Victoreen dosage meters. We used the Victoreen more extensively than any other instrument because of its portability and because service is easily and quickly obtained.

With like factors but no filter, a beam of roentgen rays from a thermionic rectifying machine contains a greater number of long wavelength rays than one from a mechanical rectifying machine. The effect on the skin is therefore more pronounced with a valve tube installation. To produce erythema requires a smaller number of roentgens with this type of installation.

During the past four years, we have been working on the problem of correlating ionization measurements with cutaneous effects and epilating dose when using unfiltered x-radiation. We were also interested to ascertain how dosage meters of the same and different manufactures checked against each other when exposed to the same roentgen ray beam.

THE ERYTHEMA DOSE

There is no general agreement among the various writers as to the number of roentgens required to produce erythema.

Friedrich and Kroenig [3] stated than an erythema may be produced with only 170 r, while Beets and Arens [8] give 2,100 r as the erythema dose when hard rays are used. The number of roentgens required for erythema is lower with unfiltered radiation produced with comparatively low voltage than with filtered radiation and comparatively high voltage.

At the Cleveland Clinic up to 600 roentgens are required to produce erythema with heavily filtered roentgen rays, while 300 r is the dose with a kilovoltage of 90 and no filter. Schinz and Slotopolsky [9] stated that 500 r is required to produce erythema. Meyer and Glasser [10] give 450 r as the erythema dose for unfiltered radiation.

A study by Kuestner [11] revealed that among German roentgenologists the erythema dose with filtered radiation is 551 r plus or minus 15 per cent. No data for unfiltered radiation were obtained. The erythema doses for soft rays (127 kilovolts) given by Widmann [12] is

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8. Beets, H. N., and Arens, R. A.: Physical Measurements and Comparative Technic in Relation to Biological Dosage, Radiology **3**:293, 1924.

9. Schinz, H. R., and Slotopolsky, B.: Ergebn. d. med. Strahlenforsch. **1**: 476, 1925.

10. Meyer, William H., and Glasser, Otto: Erythema Doses in Absolute Units, Radiology **6**:320 (April) 1926.

11. Kuestner, H.: How Many Roentgen Units Correspond to the Erythema Dose? Strahlentherapie **26**:120, 1927.

12. Widmann, B. P.: Unfiltered Roentgen Rays for Superficial Cancers of Wide and Deep Involvement, Am. J. Roentgenol. **28**:526, 1932.

500 r. Andrews and Braestrup [13] give 400 r as the erythema dose for unfiltered radiation, and Eller and Mutscheller [14] give 340 r. Pfahler [15] stated that between 650 and 700 roentgens is required for an erythema dose. Failla [16] gives 300 r as the erythema dose for unfiltered radiation and 600 r for heavily filtered radiation. It is obvious that no unanimity of opinion exists as to the number of roentgens that is required to produce erythema for unfiltered radiation.

To ascertain the erythema dose in terms of roentgens, we picked sixty-one subjects at random for our experiments. Areas of skin, 1 inch (2.5 cm.) square were exposed to various intensities of radiation. From one to six areas were exposed on each person. These were on

TABLE 1.—*Results of Calibrating Eighteen Dermatologic Installations*

Case	Rectification	Factors				Roentgens
		Milliamperes	Kilovolt Peak	Distance, Inches	Time, Minutes	
1	Thermionic	2	78	8	3	309
2	Mechanical	2	94	8	3	212
3	Thermionic	2	100	8	3	485
4	Mechanical	2	100	8	3	332
5	Thermionic	3	80	8	2	412
6	Mechanical	3	100	8	2	372
7	Thermionic	3	80	8	2	266
8	Mechanical	3	100	8	2	439
9	Mechanical	3	100	8	2	279
10	Mechanical	3	100	8	2	432
11	Mechanical	3	100	8	2	336
12	Thermionic	3	80	8	2	264
13	Mechanical	3	100	8	2	300
14	Thermionic	3	88	8	2	344
15	Mechanical	3	100	8	2	304
16	Thermionic	3	100	8	2	424
17	Mechanical	2½	100	8	3	294
18	Thermionic	1½	88	8	3	332

the flexor surface of the forearm, the inner surface of the thigh and the lumbar region. From 64 to 485 roentgens (measured in air) were administered to these areas. The kilovoltage ranged from 80 to 100. No filter was used. With thermionic rectification, all persons tested with 212 r showed erythema within a week or ten days which persisted for about two weeks. When a mechanical rectifying machine was used, erythema was observed at 266 r in the majority of cases.

It was then decided to determine the dosages used by dermatologists in their every-day practice. Eighteen x-ray machines were tested with

13. Andrews, G. C., and Braestrup, C. B.: Skin Erythema Dose in Terms of Roentgens in Superficial Therapy, Am. J. Roentgenol. **29**:663 (May) 1933.

14. Eller, J. J., and Mutscheller, A.: Dosage of Skin Therapy Expressed in International Roentgen Units, Arch. Dermat. & Syph. **27**:670 (April) 1933.

15. Pfahler, G. E., in discussion on paper by Newell, R. R.: Shall we Record and Report All X-Ray Dosages in Roentgens? Radiology **21**:216 (Sept.) 1933.

16. Failla, G., in discussion on paper by Newell.[15]

the Victoreen r-meter. The greatest difference noted among them was 128 per cent. The lowest reading obtained was 212 r and the highest, 485 r. The average of the eighteen tests showed the erythema dose in terms of roentgens to be 341.

Table 1 shows the results of calibrating eighteen dermatologic installations.

THE EPILATING DOSE

In treating a series of seventy-seven patients with ringworm of the scalp, Meyer and Braestrup [17] found that an average of 400 r with a half value layer in aluminum (photographic) of 1.5 mm. was suitable for epilation. Chamberlain and Newell [18] used 450 r for epilation of

TABLE 2.—*Results of Epilating Doses*

		Factors					
					Time		
Case	Roentgens	Milli-amperes	Kilovolt Peak	Distance, Inches	Min.	Sec.	Epilation
1	300	3	100	8	2		Partial
2	300	3	100	8	2		Complete
3	300	3	100	8	2		Complete
4	300	3	100	8	2		Complete
5	300	3	100	8	2		Partial
6	287.5	3	100	8	1	55	Complete
7	285	3	100	8	1	54	Complete
8	285	3	100	8	1	54	Complete
9	275	3	100	8	1	50	Complete
10	275	3	100	8	1	50	Complete
11	275	3	100	8	1	50	Complete
12	275	3	100	8	1	50	Partial
13	262.5	3	100	8	1	45	Partial
14	262.5	3	100	8	1	45	Partial
15	250	3	100	8	1	40	Partial
16	250	3	100	8	1	40	Partial
17	237.5	3	100	8	1	35	Partial
18	212	2	88	8	3		Partial

the scalp, while Widmann [12] gives 500 r as the epilating dose. Widmann stated that depilation of the scalp will occur with from 60 to 70 per cent of this dose; the bearded region requires 90 per cent, and the pubic and axillary hair, 100 per cent. Using the Mekapion dosage meter, Shanks [19] obtained epilation of the scalp with from 260 to 270 r.

We studied a series of eighteen cases to determine the minimal epilating dose of the scalp in children with tinea tonsurans. The series included white and Negro children of both sexes. The color of the hair in the white children varied from light blond to black. The factors

17. Meyer, W. H., and Braestrup, C. B.: Quality Determination of the Roentgen Rays, Radiology **11**:72 (July) 1928.

18. Chamberlain, W. E., and Newell, R. R.: The Epilation and the Erythema Dose, Radiology **10**:280 (April) 1928.

19. Shanks, S. C.: X-Ray Treatment of Ringworm of the Scalp, Brit. J. Radiol. **5**:761 (Oct.) 1932.

used were approximately the same in all cases except for the time: 100 kilovolts, 3 milliamperes, two minutes, and 8 inches skin focal distance. No filter was used. The Kienböck-Adamson technic was employed. All the patients were cured.

Those receiving between 212 and 262 r showed partial epilation, but sufficient to produce a cure. Those receiving between 275 and 300 r showed complete epilation, except in three instances.

It has been the custom for American dermatologists to use one arbitrary unit, which unit has been synonymous with the erythema dose and the epilating dose for unfiltered radiation. For various reasons it is difficult at this moment to set an exact number of roentgens with fixed kilovoltage or wavelength for this arbitrary skin unit. With the condenser type Victoreen r-meter, we are inclined to set it at 300 roentgens at 100 kilovolts, with the understanding that a curative epilation of the scalp and erythema of the skin may result with a smaller quantity, especially when thermionic rectification is used. The results of the epilating doses are shown in table 2.

DOSAGE METERS

That markedly different readings are obtained with different iontoquantimeters exposed to the same roentgen ray beam is well known. This applies to instruments of the same manufacturer as well as those of different manufacturers. In discussing Newell's paper, Pfahler [15] expressed the opinion that different iontoquantimeters give markedly different readings when exposed to the same roentgen ray beam. We made the same observations when we compared readings obtained with the Mekapion and Victoreen dosage meters. The readings with the Victoreen dosimeter [20] were 28 per cent greater than those obtained with the Mekapion dosimeter.

At first we found that the readings obtained with the Victoreen r-meter changed after each recalibration and checking up of our instrument by the manufacturer. This has not been so lately. There is a difference of 17 per cent between the readings obtained with the Victoreen r-meter four years ago and those obtained with the condenser type Victoreen within the past year. Recently we tested ten Victoreen dosimeters of the regular and the condenser types. The average variation was approximately 5 per cent. The difference is probably less under laboratory conditions.

It is obvious that surface dosage cannot be standardized with scientific accuracy until x-ray apparatus and instruments of precision are

20. Since writing this article we have been informed that the mekapion and certain other iontoquantimeters have been modified so that their readings now agree with the Victoreen condenser type dosemeter.

internationally standardized. When this has been accomplished, it will be possible to express cutaneous effects in physical units with greater accuracy because then there will be a more definite relation between the two. Present technic can be made more accurate by using a thin filter.

We shall discuss arguments for and against routine filtration at a later date. Also, in a subsequent paper we shall discuss many phases of this subject and many details which, for lack of time, cannot be even mentioned here.

CONCLUSIONS

1. With thermionic rectification, 100 kilovolts, unfiltered radiation, a condenser type Victoreen dosimeter and 1 square inch areas of skin, conspicuous erythema always resulted from the application of 212 r. With mechanical rectification, erythema occurred in the majority of cases with 266 r. This discrepancy can be avoided to a large extent by modifying the voltage or by using a thin filter. With filtered radiation and with higher voltage (shorter wavelengths) a larger number of roentgens is required to produce erythema.

2. As is well known, visible cutaneous effects are not reliable as a scientific index, although when carefully done they have been found sufficiently accurate as a guide in practical cutaneous roentgen therapy. An ionization difference of 50 or 100 per cent might be overlooked when one depends on cutaneous effects.

3. To produce fairly complete epilation of the scalp in children with the Kienböck-Adamson technic and with the aforementioned apparatus, instruments and factors, 300 r is required, although a degree of epilation sufficient for the cure of tinea tonsurans can be obtained with smaller doses.

4. We use 300 r and 100 kilovolts for the arbitrary skin unit employed by American dermatologists for the past two decades. The skin unit is also the arbitrary erythema dose for the skin and the epilating dose for the scalp of children. These figures are obtained with the condenser type of Victoreen dosimeter.

5. We checked eighteen roentgen installations used by dermatologists. In roentgens, the skin unit varied from 212 to 485 with the Victoreen dosimeter, a difference of 128 per cent. The average was 341.

6. We found that dosage meters from the same and from different manufacturers gave markedly different readings when exposed to the same unfiltered roentgen ray beam. Recently, however, the checking of ten dosimeters from the same manufacturer showed an average variation of only 5 per cent.

The modern dosimeter is a useful and valuable apparatus. When it is properly used and the results are correctly interpreted, the instrument provides the most rapid and most accurate method of estimating surface dosage. We recommend this method to all dermatologists to be used in connection with the time-honored cutaneous effects which cannot yet be discarded.

7. When recording the surface dose, it is well to give the number of roentgens, the kilovoltage or effective wavelength or half value layer of aluminum, all mechanical and electrical factors, type of x-ray apparatus and the make and type of dosimeter and, of course, the filter if one is used.

8. We do not advocate a dosimeter for the direct estimation of every dose administered, but we do advocate its use for the quick and frequent checking of technic. With this addition, we believe that the so-called indirect technic, with dependence on the usual factors and constants, a technic that has stood the test of time, will continue to be the daily routine of American dermatologists.

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ABSTRACT OF DISCUSSION

Dr. Otto Glasser, Cleveland: A number of years ago Dr. MacKee proposed a dosage unit for roentgen dosimetry in dermatology. In spite of some shortcomings, this unit was very ingenious. Dr. MacKee tested a number of dermatologic x-ray machines according to the cutaneous reaction and based this dosage formula, which subsequently became known as the MacKee formula, on the results obtained with the most efficient of these x-ray machines.

The great advantage of this was that the machines which had a lower output always produced a smaller dose and therefore no overdosage was ever reported when dermatologists used the MacKee formula. The shortcomings were, as brought out by Dr. MacKee and Dr. Cipollaro, that there still was a wide variation in the actual output of different machines, even when the MacKee formula was used. Dr. Cipollaro reported that he tested eighteen different transformers and found differences for the same dosage as calculated by the MacKee formula of about 128 per cent. I have compared about fifty different transformers and have found an even greater difference in output.

A few years ago I was instrumental in investigating the original roentgen unit and in making the preparations for its adoption at the International Congress in Stockholm. Ever since then Dr. MacKee has been much interested in the use of this dosage unit in dermatology. Dr. MacKee and Dr. Cipollaro have gone into this problem thoroughly and conservatively.

A few years ago the dosimeters were not satisfactory, as Dr. MacKee's paper brought out clearly, but in the last two or three years improvements have been made, and at the present time there are dosimeters that can be used in practice and that are practically fool-proof.

Dr. Earl W. Netherton, Cleveland: It has been my good fortune in the past two or three years to be associated with Dr. Glasser in using this r unit as applied to dermatologic therapy. We have not changed the technic in that

we use the same fractional technic as Dr. MacKee and his men have advocated in the past, but our dosage has been computed on the terms of the r unit as worked out by Dr. Glasser. We have had no bad results; our results have compared favorably with the ones that we obtained prior to the use of this r unit.

There is a practical side of roentgen therapy that should be considered, namely, the medicolegal side. If a unit dose can be established and a common language used, it will undoubtedly have some medicolegal status in the future.

Dr. George C. Andrews, New York: I am interested to compare the findings of Dr. MacKee and Dr. Cipollaro with those of Dr. Braestrup and myself on the same subject. The apparent discrepancies cannot be explained alone by the instruments used in measurement, because I am sure that we both measured as accurately as possible. I know that our instruments were checked and rechecked by the Bureau of Standards at Washington, D. C. The discrepancies in the results are due to the fact that the number of r units in an erythema dose is influenced by the wavelength of the radiation, by the size of the test area, by the thickness of the glass wall of the tube and by the type of rectification. In modern tubes the pyrex glass wall absorbs a considerable fraction of the output of the soft rays. The minimum wavelength we used was 0.13 angstrom.

For the past two years at Vanderbilt Clinic we have been using an erythema and epilating dose of 400 r, with 100 kilovolts. With this erythema dose we have obtained epilation in about one hundred and fifty cases of tinea capitis, without any bad results from overirradiation. We have found that with our equipment 400 r is the proper erythema dose.

It is possible that we are all using biologically equivalent doses, but that the dose is influenced somewhat by other factors, particularly wavelength.

Dr. C. Guy Lane, Boston: In the last two years at the Massachusetts General Hospital I have been interested in using the roentgen unit in the treatment of cases of tinea. My associates and I have so far collected twenty cases in which the dosage has been computed with the Victoreen meter. We have used 100 kilovolts unfiltered radiation and thermionic rectification.

We are keeping track particularly of the age and of the coloration and the circumference of the scalp of these children, with the idea of attempting to see later whether we can arrive at the dosage for different ages, colorations or possibly even types of tinea.

I have a distinct feeling that in certain types, for instance, a slightly scaly, superficial type, a dosage of perhaps from 75 to 80 per cent of epilation is sufficient for cure. On the other hand, in certain of the kerion types which are not cured spontaneously, and particularly in favus, we need from 90 to 100 per cent epilation for a cure.

So far we have used a dosage of from 290 to approximately 360 r as an epilation dose. There has been one variable factor that we have not been able to overcome, and that is that for the most part the treatments have been given by different resident roentgenologists, usually by a nurse technician under their supervision, but the time element has prevented the treatments from being given in the regular clinic. In none of these cases has erythema on the scalp resulted. The epilation has varied from partial and somewhat patchy eruption to a total epilation.

I believe that somewhere between 290 and 360 r, at least with our machine, lies the total epilation dose for tinea, the dose to be varied with the individual case.

I was particularly interested in Dr. Cipollaro's remarks regarding the difference between the instruments with mechanical and with thermionic rectification.

I agree absolutely that factors other than the roentgen unit are undoubtedly necessary in the determination of the dosage for treatment in these cases.

DR. CORNELIUS FERD LEHMANN, San Antonio, Texas: In the last three years I have been trying to correlate the measurement of roentgen doses in roentgen units with biologic effect. I take as my biologic unit a dose that will produce a satisfactory epilation without erythema in two weeks, with recurrence of the hair beginning on an average in six weeks, and a healthy scalp when observed months afterward. That dose I have found to be from 400 to 450 r.

I realize that there are many factors explaining the discrepancy in what the dermatologist would call the skin unit. Of course, one wants to use as little roentgen therapy as is effective.

I should like for Dr. MacKee to tell what he would consider to be the minimum effective dose in roentgen units for acne.

DR. LESTER HOLLANDER, Pittsburgh: I began to use this direct method of measurement of roentgen rays about two and a half years ago in the measurement of massive doses of roentgen rays, and again I want to express my appreciation to Dr. MacKee for bringing before the section a more accurate method of determination than the indirect method for which we are indebted to his work. In the massive doses of roentgen rays the problem is much more difficult than that in the fractional doses of roentgen rays.

As a result of giving 6,000 r in one week in a malignant condition of the mucous membrane and also in melanocarcinoma, I have gotten a huge blistering dose, and in giving a large dose like that I believe that it is exceedingly important that one check up not only on the machine occasionally, but on each dose as it is given.

I have used the Victoreen dosimeter for a year and a half, and now a new type of dosimeter is manufactured, I believe by the Westinghouse people, which gives fairly accurate results.

I believe that in the administration of a massive dose, the direct estimation, as outlined by Dr. MacKee and Dr. Cipollaro, will be of great value.

DR. GEORGE M. MACKEE, New York: In 1916, the late Dr. J. S. Shearer, then professor of physics at Cornell University, stated that for many years practical ionization dosimeters would, in the hands of dermatologists, be an expensive and dangerous toy. Dr. Shearer was correct. For over twenty years I have been endeavoring to establish a practical ionization technic for dermatologists. During that time it has been necessary to purchase over a dozen instruments costing from $300 to $1,500 each. They were all unsatisfactory for practical work and had to be discarded.

There are now on the market several reliable ionization dosimeters that are suitable for practical, routine roentgenologic work in dermatology. We finally selected the Victoreen condenser dosimeter because, being manufactured in this country, it is quickly serviced. Also it is small, light, portable, accurate and dependable. Undoubtedly other American concerns will soon manufacture suitable instruments. In my opinion, the time has arrived when the dermatologist who indulges in roentgen therapy should have and use a modern ionization dosimeter. I do not agree that such an instrument is fool-proof. One must be able to use it expertly and to interpret the results properly. Personally, I should not care to depend solely on this method of estimating the dosage. The time-honored cutaneous tests must also be used. The two methods check each other. Naturally ionization or any other method will not guard against errors of judgment.

It is not necessary to employ a dosimeter for the estimation of every dose that is administered. For daily work one may depend on the usual technical constants. The dosimeter provides a sufficiently accurate and quick means of frequently checking technic. As an example, assume that a technic has been established by means of both cutaneous effects and dosimetry. Assume also that a tube is broken and that the intensity and quality of radiation from the new tube are unknown. The output from the new tube may be as much as 100 per cent over or under that with the old tube. To determine the output of the new tube by cutaneous effects might require several weeks, whereas it can be determined in five or ten minutes with a dosimeter.

At present, it is impossible to state dosage accurately solely in terms of roentgens. It is necessary to record quality. In fact, all the factors or constants should be given. It is advisable, also, to mention the exact type of dosimeter that was used. As Dr. Cipollaro said, we found with unfiltered radiation that the number of roentgens vary with different makes and models and even with different instruments from the same concern. This is less so now than formerly, and perhaps in the near future all instruments will register the same under like conditions.

Dr. Cipollaro mentioned the difference in output between thermionic and mechanical rectification when using unfiltered radiation. This can be obviated by using a thin filter. Also, with filtered radiation, the various modern dosimeters register more nearly alike. Whether or not a filter is desirable for routine work is debatable. There are advantages and disadvantages.

Obviously, at present it is difficult to state the arbitrary skin unit (erythema dose, epilating dose) in roentgens. After years of effort we have set this unit at 300 r (unfiltered; condenser Victoreen dosimeter with chamber in air) with the understanding that erythema may occur with a smaller dose and that it may not occur with a larger dose, depending on many things: the size of the portal, the age of the patient, the part of the body and sensitivity; also, that with like factors, the effect is greater with thermionic than with mechanical rectification.

Dr. Cipollaro has done an enormous amount of work, only a small part of which was used for this article. The remainder will appear in subsequent communications. I thank Dr. Glasser for his patience, kindness and invaluable help with the many perplexing problems arising during the course of this work.

Dr. Anthony C. Cipollaro, New York: Dr. Andrews spoke about discrepancies. The discrepancies that may occur are numerous. For example, one must consider one's tube. Is the tube old? Is the target pitted? Is the tube beginning to get gassy? Does the thickness of the glass vary greatly? The modern tubes show little variation. Those who have been practicing dermatology for some time have old x-ray tubes. These older tubes showed as much as 100 per cent variation in my experience.

I was hoping that Dr. Glasser would say something about the difference in output between the thermionic and the mechanical rectifying machine. With thermionic apparatus one obtains all of the soft rays as well as the hard rays, whereas with mechanical rectification only the peak volts are used. Therefore, the cutaneous effects with the two types of apparatus vary.

Dosage meters of different manufacturers differ. Three years ago, when Dr. Strauss was here, I told him that I found a difference of 28 per cent between his machine and the Victoreen machine. Dr. Strauss admitted the existence of the discrepancy and offered no satisfactory explanation.

The readings we now obtain with the Victoreen dosimeter are 17 per cent lower than they were four years ago, whereas the readings with the Mekapion instrument obtained four years ago as compared with those which we now obtained with the Victoreen instrument are 11 per cent lower.

The difficulty has been in obtaining an instrument which would measure the roentgen unit uniformly. I think that the instruments in use today are accurate and uniform.

All our readings were taken in air. The secondary effects of the rays were not included in our figures.

It seems as though the dose that Dr. Hollander uses for treating malignant conditions of the mucous membranes is too high. I should hesitate to administer a dose of 6,000 r in one week with or without filtration, even to a small area. It is possible to get a third degree radiodermatitis when a dose of 6,000 r is administered without filtration.

In the treatment of acne vulgaris, we administer 75 r each week. As a rule we use no filter. Dr. Lehmann stated that his erythema dose is 450 r. The reasons for these differences have been sufficiently discussed.

LUPUS ERYTHEMATOSUS DISSEMINATUS ACUTUS HAEMORRHAGICUS

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BOSTON

Subcutaneous hemorrhages in lupus erythematosus are rarely mentioned in the textbooks. Alderson and Way,[1] Stuhl,[2] Jäger and Kohl[3] and others have reported cases of gold poisoning in which hemorrhage was a symptom. Cases of the acute hemorrhagic type of lupus erythematosus apparently are rare. Madden,[4] in 1932, in his review of the literature on lupus erythematosus disseminatus, did not mention cutaneous hemorrhage.

In 1922, Scholtz[5] reported a case which he designated lupus erythematosus acutus disseminatus haemorrhagicus. Our case was similar to his, except that it had a much shorter course. Scholtz[5] considered that there are two types of disseminated lupus erythematosus: In one there is gradual diffusion of the disease and the skin lesions remain without change for a long period, after which the disease subsides and the patient recovers or it has a long debilitating course and the patient dies, and in the other there is a sudden flare-up with an acute condition resembling erythema multiforme or erysipelas, with fever, chills and general prostration, and the patient declines rapidly and dies in a few months. Our case falls in the second group, with the added feature that hemorrhagic lesions developed.

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1. Alderson, H. E., and Way, S. C.: Unusual Reaction from Gold and Sodium Thiosulphate Injection in Treatment of Lupus Erythematosus, California & West. Med. **28**:809 (June) 1928.

2. Stuhl: Ist Krysolgan ein Kapillargift? Deutsche med. Wchnschr. **50**:207 (Feb. 15) 1924.

3. Jäger, B., and Kohl: Grundsätzliche Erwägungen im Anschluss an einen Fall von Golddermatitis (Triphal), Arch. f. Dermat. u. Syph. **154**:76, 1927.

4. Madden, J. F.: Acute Disseminated Lupus Erythematosus, Arch. Dermat. & Syph. **25**:854 (May) 1932.

5. Scholtz, M.: Lupus Erythematosus Acutus Disseminatus Hemorrhagicus, Arch. Dermat. & Syph. **6**:467 (Oct.) 1922.

Mook, Weiss and Bromberg [6] reported thirteen cases of lupus erythematosus disseminatus, of which five were apparently of the second type, without the hemorrhagic lesions. One case followed a course similar to that of ours, except that our patient received one injection of erysipelas antitoxin after the lesions became well established and theirs did not have the hemorrhagic lesions.

Throne, Kingsbury and Myers,[7] in 1932, mentioned that in their opinion a case of discoid lupus erythematosus might be activated by therapy with a gold preparation to develop into the disseminated type. On considering this phase we came to the conclusion that had this been the case in our patient, we should have had more symptoms of gold poisoning than did appear. The albuminuria was transient and appeared in only the first examination.

Leukopenia was noted by many authors and mentioned as an important diagnostic factor. It was also noted in our case, and treatment was given which increased the leukocytes from 2,400, after the first injection of pentnucleotide, to nearly 9,600 in ten days, but without benefit to the patient.

REPORT OF A CASE

History.—An unmarried man, 23 years old, a student, of Italian parentage, was admitted to the dermatologic service of the Boston City Hospital, on Aug. 1, 1932. His chief complaint was of a diffuse red, erythematous area which covered the nose, cheeks, ears, lower part of the forehead and lips. There were also bloody crusts on the ears, forehead, nares and lips.

For a month before the onset of the cutaneous eruption, the patient complained of general weakness and malaise. Approximately three months previous to admission a small erythematous area appeared for the first time on the bridge of the nose at the site of an injury received two years before. The erythema spread during the next few weeks until it covered the face on each side of the nose and the ears, resembling a severe sunburn. Cold cream was applied. Two months later a few areas of alopecia were noticed on the scalp. A diagnosis of lupus erythematosus was made at another institution, and an intravenous injection of 25 mg. of gold and sodium thiosulphate was administered. After the treatment the patient had nausea, vomiting and a temperature of 101 F. A physician who was called diagnosed the condition as erysipelas and gave an intramuscular injection of erysipelas antitoxin. The patient's temperature rose immediately from 101 to 104 F. and remained so for five days; then he came to the Boston City Hospital.

The patient had had a slight hacking cough for months, but it was not productive of sputum. He gave no history of hemoptysis, nausea, vomiting, pain after meals, diarrhea, constipation or bloody or tarry stools. The skin always sunburned easily. The family, social and occupational histories were essentially irrelevant.

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6. Mook, W. H.; Weiss, R. S., and Bromberg, L. K.: Lupus Erythematosus Disseminatus, Arch. Dermat. & Syph. **24**:786 (Nov.) 1931.

7. Throne, B.; Kingsbury, J., and Myers, C. N.: Unusual Clinical Manifestations Following Intravenous Administrations of Gold Compounds, Arch. Dermat. & Syph. **25**:494 (March) 1932.

Physical Examination.—The patient was well developed, well nourished, partially incoherent, lying flat in bed and restless, picking at numerous bloody crusted areas on the forehead, around the nose and on the lips. His attention could be obtained and held only with difficulty, owing to his toxic state. The temperature was 104 F., the pulse rate 90 and the respiratory rate 25.

There were numerous small irregular areas of alopecia scattered over the dorsum and lateral portions of the scalp. The skin of the bald areas was reddish blue but was free from crusts. Both pinnae were covered anteriorly and posteriorly with grayish-brown crusts which, on removal, left oozing and bleeding lesions. Crusted areas were present on the lower portion of the forehead and in the eyebrows. The sclerae were clear, and extra-ocular movements were normal. Ptosis, lid lag and nystagmus were not demonstrated. The skin on the bridge of the nose and both sides of the face as far posteriorly as the ears and as far down as the level of the mouth was covered by a bluish-pink erythematous rash. However, only a few of the follicles in the erythematous area were enlarged. There was considerable crusting of the skin on the upper lip and of the mucous membranes on the inside of the nose and on the exposed portions of the lips. All the crusts left bleeding bases when removed. On the extensor surfaces of the upper extremities and on the backs of the hands, the skin was covered with multiform, slightly raised, reddish-blue papules. The color disappeared on pressure. Numerous small, deep-seated, dark red, petechia-like spots, which did not press out, were present on the palms, finger-tips, soles and toes. The skin on the extensor surfaces of the lower extremities, particularly on the upper portions of the legs, was covered with a dark red papular eruption definitely follicular in distribution. In addition, there were a few papules and a few vesicles on the thighs. The tongue protruded in the midline with a coarse tremor and was heavily coated. Excepting a slight redness of the throat and an atrophied left testicle the rest of the physical examination revealed no abnormalities.

Diagnosis and Course.—The diagnosis was acute lupus erythematosus disseminatus with erythema multiforme of toxic origin. The final two weeks of the patient's life were spent in the hospital, during which time he was semistuporous or delirious. His temperature was sustained between 102 and 104.5 F. (rarely dropping to 100 F.) until the day of death, when it reached 105.5 F. The pulse rate ranged from 100 to 130, and respirations climbed slowly and steadily from 24 to 45 per minute. Ointment of ammoniated mercury, 5 per cent, was applied twice a day to all the crusted lesions, with resultant improvement. At first the patient took fluids and a soft solid diet well, but during the second week he could take only fluids, and those with difficulty. Because of leukopenia (3,000 white blood cells and less) he was given daily intramuscular injections of 10 cc. of pentnucleotide which were continued until the day of death. The skin lesions changed little, except that the crusted areas spread to the scalp and to the mucous membrane of the mouth, and the purpuric lesions on the hands and feet became more noticeable and numerous. No heart murmurs were heard. The course was steadily down-hill. He became more toxic and weaker. A few râles were heard at the bases of the lungs on the tenth day. These increased, the pulse rate and respiratory rate rose, and he died fifteen days after admission.

Laboratory Data.—The first urinalysis revealed a slight trace of albumin. Subsequent examinations gave negative results. The white blood cell count ranged from 3,000 to 2,400 during the first four days. The differential counts were essentially normal throughout the course. The red blood cell count was 4,200,000, and the hemoglobin was 65 per cent. Four blood cultures were negative. The

Kahn reaction of the blood was negative. On the eleventh day after admission the blood sugar was 108 mg. per hundred cubic centimeters, the nonprotein nitrogen 53 mg. and the chlorides 484 mg. A stool, examined on the day of admission, was negative for gross or occult blood and for mucus. Nine days later, there was a 4 plus guaiac reaction. On culture, stools and urine were reported negative for Bacillus typhosus, Bacillus paratyphosus A and B and the dysentery groups. The spinal fluid was normal.

Autopsy.—Autopsy was performed two hours after death by Dr. W. C. Smith. The body was that of a well developed, moderately well nourished white man. There were no palpable cervical, axillary or inguinal nodes. Small (from 0.7 to 1.5 cm.) reddish-brown crusts were uniformly distributed over the face, chin and scalp; they were about 0.5 mm. thick, and sometimes confluent. The lateral aspects of both ears were covered with crusts. There was an area of moderate alopecia, 6 cm. in diameter, centered on the bregma. Brown crusts, 2 cm. long, were present on the left wrist, with a raw surface beneath. A bluish ecchymotic area, 2 cm. across, was noted on the latter aspect of each knee. Many bluish papules (1 mm.) were present on the legs, and there were petechia-like hemorrhages under the toe-nails.

Peritoneal Cavity: There were several mesenteric nodes the size of peas, of average consistency, with a translucent, gray cut surface.

Lungs: The posterior aspects of the lower lobes were dark purple. The corresponding parenchyma was firm and dull red, yielding a reddish fluid on pressure.

Spleen: The weight was 180 Gm. The cut surface was dull red, with prominent malpighian corpuscles.

Gastro-Intestinal Tract: The entire ascending colon from the cecum to the hepatic flexure was lined with a thick brownish exudate, in places partly detached and hanging in small shreds about 1 cm. long. There were, also, several round, hard, brownish plaques, 1 cm. in diameter, raised 2 mm. above the surface. The wall of the gallbladder was moderately thickened. The serosa was normal. There was an abrupt transition to normal intestine within 3 cm. of the hepatic flexure.

Larynx: There was an irregular shallow ulceration, 7 mm. wide, on the posterior wall of the larynx, extending from between the arytenoid cartilages above to the true vocal cords below.

Vertebral Marrow: The color was dark red.

The liver, kidneys, pleural and pericardial cavities, heart, pancreas, suprarenal glands, aorta, testes, brain and middle ears were normal.

Anatomic Diagnosis: The diagnosis was membranous colitis, hypostatic pneumonia and laryngeal ulceration.

Microscopic Examination.—Lungs: There was advanced bronchopneumonia, with early formation of abscesses. Large bacilli with rounded ends were present in the alveoli.

Spleen: Numerous mononuclear phagocytes containing a large amount of hemosiderin were present. Small fibrin thrombi were found in some of the venous sinuses.

Liver: This organ showed a few small foci of necrosis; the degenerating cells were acidophilic and were invaded by polymorphonuclears. There was an occasional Kupffer cell containing from a moderate to a large amount of hemosiderin.

Ascending Colon: There was a total uninterrupted necrosis of the mucosa and superficial submucosa, with thrombosis of the vessels and masses of fibrin, polymorphonuclears and organisms at the surface. The organisms included gram-positive bacilli and short chain cocci, none appearing in any specific relationship to the process. The submucosa was much thickened and edematous, with a large

amount of fat and thick, pale, hyalin-like collagen fibers, among which were delicate strands of fibrin, large active fibroblasts, loosely distributed mononuclear phagocytes and a few lymphocytes. The polymorphonuclears were relatively few, occurring chiefly in the more superficial submucosa. Mononuclear phagocytes extended into the muscularis and serosa. In addition to the chronic inflammatory cells and increase of collagen and fat, a further point indicating chronicity of the lesion was the presence of a few well organized mural thrombi in the deeper vessels of the wall.

Mesenteric Nodes: There was a prominence of reticulo-endothelial element. The lymph sinuses occupied almost half the area in one node. Large mononuclear phagocytes, the cytoplasm often containing vacuoles of varying size, were numerous in the sinuses. There were also a few polymorphonuclears, but no organisms. There was a relative reduction of lymphocytic element, suggesting partial depletion. The pulp reticulum was loosely filled with lymphocytes. A few were binuclear. There was an occasional multinucleate plasma cell, with deeply basophilic cytoplasm and multiangular outline. Germinal centers were lacking.

Larynx: There was an ulceration of mucosa, with undermining of the edge. A moderate infiltration by polymorphonuclears and lymphocytes in about equal numbers was present. Fibrin thrombosis of small vessels was noted. Masses of organisms were found at the surface, including cocci, bacilli and diphtheroid-like organisms. There was no tubercle formation.

Vertebral Marrow: There was moderate hyperactivity of both the red cell and the granulocyte series, with a slight predominance of the less differentiated forms. Mature granulocytes were present, but disproportionately few, perhaps half as many as would be expected with this degree of activity.

Femoral Marrow: A few small islands of activity, with maturation, were present in both series.

Skin: No sections were taken.

The heart, kidneys, aorta and thyroid gland were normal.

Diagnosis: The diagnosis was: membranous colitis, subacute; bronchopneumonia; hemosiderosis of the spleen; focal necrosis of the liver, with slight toxicity; a nonspecific toxic reaction of the mesenteric lymph nodes; hyperactivity of the vertebral marrow, and subacute laryngeal ulceration.

Cultures of the mucosa of the colon gave no significant result.

COMMENT

In spite of the fact that hemorrhages have been reported as a symptom of gold poisoning, we feel that the hemorrhagic lesions in our case were not due to the gold preparation used. Cases of hemorrhagic lesions have been reported in which no gold preparation had been given (Scholtz [5]). Therefore, why could not the cases reported as caused by treatment with a gold preparation have been of the type that shows hemorrhagic lesions in the course of lupus.

It does not seem to us that because gold was found in the skin in some of the cases reported, the acute hemorrhagic lesions were necessarily caused by it.

Membranous (diphtheritic) colitis of the type and extent found in our patient has, so far as we have been able to find, never before been described in association with acute disseminated lupus erythematosus.

Could the colitis be due to excretion of a gold salt through the wall of the ascending colon? This seems improbable when it is considered that gold is excreted mainly by the kidneys.[8] Dewitt [9] found less gold per weight of tissue in the intestine than in any other organ (in guinea-pigs), and Møllgaard [10] could find only traces.

Autopsies on patients dying after treatment with a gold preparation are relatively rare. The observations have best been described in patients with tuberculosis treated with sodium aurothiosulphate. In Clarke's [11] collection of twelve such cases, the average dosage was 4.23 Gm. (against 0.025 Gm. in our case), but no colitis was noted, and the predominant observation was tubular nephritis (absent in our case). In another patient, who had received 4.15 Gm., "a large ulcerated area covered half the surface of the cecum and extended 1 inch into the ascending colon," but no mention was made of gold as the possible cause.

Diarrhea, a common symptom after treatment with sodium aurothiosulphate,[12] was absent in our case.

Hemosiderosis of the spleen, which has been noted experimentally following injections of gold and sodium thiosulphate in rabbits,[13] was present.

However, when one considers the small dose received (assuming no error in the administration), it appears probable that gold as a factor here was of negligible importance.

Could the colitis have been the focus of formation of toxin at the root of the whole disease process? Our only clinical clue to its duration was a normal stool on admission, on August 1 (nineteen days after injection of the gold salt), followed by a 4 plus guaiac reaction on August 9 and death on August 15, giving a hypothetic minimum duration of six days and maximum of about fifteen. The subacute appearance of the lesion microscopically is possibly consistent with such a duration, but a longer one is thought more probable. The extent of intestine involved favors this view.

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8. McCluskey, K. L., and Eichelberger, L.: Effect of Injections of Sanocrysin on Normal Dogs, Am. Rev. Tuberc. **12**:329, 1925. Elliott, T. R.: Treatment of Pulmonary Tuberculosis with Sanocrysin, Lancet **1**:126, 1926.

9. Dewitt, L. M.: Use of Gold Salts in the Treatment of Experimental Tuberculosis in Guinea-Pigs, J. Infect. Dis. **23**:426, 1918.

10. Møllgaard, H., and others: Chemotherapy of Tuberculosis, Copenhagen, A. Busck, 1925.

11. Clarke, B. R.: The Treatment of Pulmonary Tuberculosis by Sanocrysin, Tubercle **7**:592, 1926.

12. Dumarest, F., and others: Recherches sur la valeur thérapeutique de la sanocrysine de Møllgaard, Paris méd. **1**:549, 1927.

13. Brown, H.; Salesby, E. R., and Schamberg, J. F.: A Study of the Toxic Effects of Certain Gold Compounds, J. Pharmacol. & Exper. Therap. **28**:141, 1926.

Both the colitis and the laryngeal ulceration were probably secondary manifestations of the low resistance which seems to characterize the disease, and both may here be added to the multiplicity of lesions already described.

No other toxic focus was found. The tonsils and roots of the teeth could not be examined. Tuberculosis was apparently entirely absent.

SUMMARY

A case of acute disseminated lupus erythematosus with hemorrhagic lesions is described. Administration of gold and sodium thiosulphate (25 mg.) and, later, erysipelas antitoxin was of no apparent benefit. Leukopenia was successfully treated with pentnucleotide, but eventually death occurred, three and a half months after the onset.

Autopsy revealed diffuse membranous colitis of the entire ascending colon, ulceration of the larynx and no tuberculosis.

ORIGIN AND NATURE OF PIGMENTED NEVI (SCHWANNOMAS)

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The term "nevus" was originally used with its Latin meaning of "a mark," with no conception of the etiology or pathology of the various types of lesions. As the various types of nevi were studied microscopically, other designations were utilized which seemed more appropriate; for instance, vascular nevi are now generally designated as angiomas.

There are certain types, however, which have not been satisfactorily classified and for which the name "nevus" is still used. The most interesting type in this group is the pigmented nevus. More and more interest has been evinced in this lesion, and certain ideas are gaining ground. Some of the older theories of the origin of the pigmented nevus, i. e., that it was a histiocytic tumor or an endothelial tumor, have long been abandoned. The two theories which still have supporters are (1) the epidermal theory of Unna, Bloch and others and (2) the theory of nervous origin of Soldan, which was modified by Masson,[1] apparently with considerable success. Unna believed that ordinary palisade basal epidermal cells become transformed into nevus cells through the loss of intercellular bridges and of fibrillary structure. The nevus cells then descend into the dermis. It is not difficult to appreciate this idea, since the material studied was, in all probability, fixed in formaldehyde or a similar fixative and stained with hematoxylin and eosin, neither a good fixative nor a good stain for cytologic study. With improved technical methods and certain new methods for the study of pigment, the most important of which are the dopa reaction and the silver reaction, it became necessary to reevaluate the ideas relative to the origin and nature of the pigmented nevus.

Masson applied his improved staining methods (Bouin's fixation, with trichrome stain [iron hematoxylin, acid fuchsin-ponceau de xylidine and aniline blue]) to the study of nevi, with interesting results. He found that while nevi present a variety of pictures, there are certain charac-

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From the Section of Dermatology of the Department of Medicine, University of Chicago.

1. Masson, P.: Les naevi pigmentaires, tumeurs nerveuses, Ann. d'anat. path. **3**:417 (May) and 657 (July) 1926.

teristics common to all. In the distal portion, immediately beneath the epidermis, the growth is composed of oval and round cells, occurring singly or in groups, with large, pale nuclei and a moderate amount of pink-staining cytoplasm. Multinucleated cells are also often seen in this location. In the deeper portions the cells are elongated, and the nuclei and cell processes may be seen, whether the specimen is cut longitudinally, tangentially or transversely. In certain nevi a lamellated structure is seen which is similar to a tactile corpuscle (Meissner). When special silver methods are used, nerve fibers are found extending into and ending in the region of these cell masses.

On the basis of his study, Masson advanced the hypothesis that nevi originate from the sheath of Schwann. He noted that the cells in the superficial portion of the tumor had characteristics similar to those of *cellules claires,* which are found in the basal portion of the epidermis between the palisade basal cells. He stated the belief that these clear cells migrated into the epidermis, probably also from the sheath of Schwann.

TYPES OF NEVI

I have made a careful study of several hundred nevi obtained from the dermatologic clinic at Zurich, through the late Professor Bloch, the Clinique des maladies cutanées at Strasbourg, through Professor Pautrier, and the clinics at the University of Chicago. I have also had the opportunity of studying sections from an unusual case of generalized nevi and from a case of acquired nevi, through Drs. Zeisler and Ebert, respectively. There is a surprising difference in the pictures presented by various nevi, but there are two chief pictures which are seen singly or in combination. They may be classified into the "cellular" type or the "nerve" type or into all possible combinations of the two types. The simplest type is that represented by most smooth brown nevi. Here the fundamental change consists in an increase in the number of the melanoblasts at the epidermodermal junction.[2] This, of course, results in the increased activity of the pigment, with hyperpigmentation of the epidermal cells. In this type no groups of cells are seen, merely a thick sheet of melanoblasts at the epidermodermal junction. The second type consists of the multiplication of melanoblasts in groups, so that small and large groups of the cells are seen attached to the epidermis. This picture was present in sections from a case of multiple nevi presented by Zeisler before the Chicago Dermatological Society. This also results in marked hyperpigmentation of the epidermis. The third type is exemplified in sections from a case of multiple acquired nevi presented by Ebert

2. Becker, S. W.: Cutaneous Melanoma, Arch. Dermat. & Syph. **21**:818 (May 7) 1930, fig. 8; Melanotic Neoplasms of the Skin, Am.J.Cancer **22**:17 (Sept.) 1934, fig. 6.

before the Chicago Dermatological Society. Here one could see an increase in the number of the clear cells. Whether this increase in number had been present since birth cannot be stated with certainty, but it is not improbable. Multiplication of the clear cells results in small and large groups of the cells, which press the basal cells to one side and form a globular mass, often still attached to the epidermis but at times entirely separated in the dermis (fig. 1). This is the process which was described by Unna and others and which gave them the impression that the palisade basal cells were changing their appearance, and multiplying and

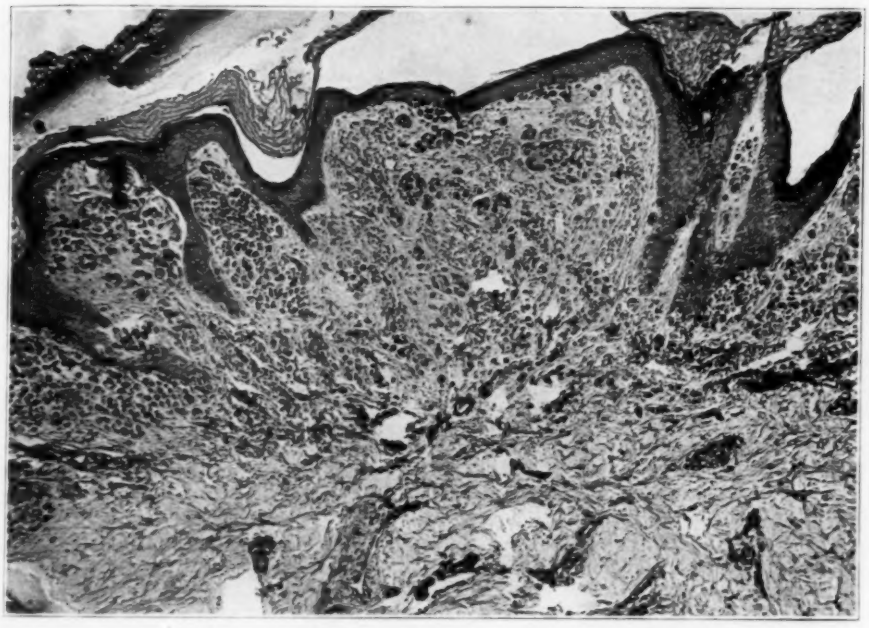

Fig. 1.—A pigmented nevus of the purely cellular type (loaned by Dr. M. H. Ebert). The lesion consists of groups of nevus cells with no cell processes. Some groups of cells are contiguous to the clear cells in the basal layer. Hemalum-erythrosin saffron stain.

dropping off in groups into the dermis. Unna did not appreciate the existence of two types of cells in the epidermis, probably owing to the technical methods which were in use at that time. It is becoming more generally accepted that two distinct types of cell exist. No part of these three types of cellular nevi suggests the nerve type of nevus. In contrast to this cellular type of nevus the nerve type often has few of the superficial cells and may consist predominantly of structures suggesting tactile corpuscles of Meissner (figs. 2 and 3). All sorts of combinations of the two types are seen.

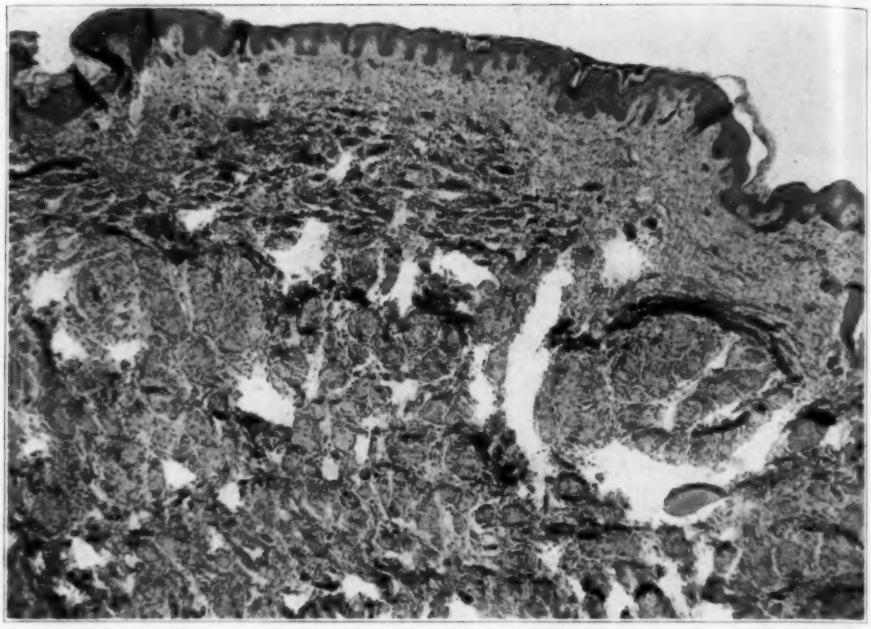

Fig. 2.—Pigmented nevus of the nerve type. Clinically this was an elevated, brown lesion. The growth is not contiguous to the clear cells in the basal layer. With the exception of the superficial portion, the entire lesion is of the nerve type. Hemalum-erythrosin saffron stain.

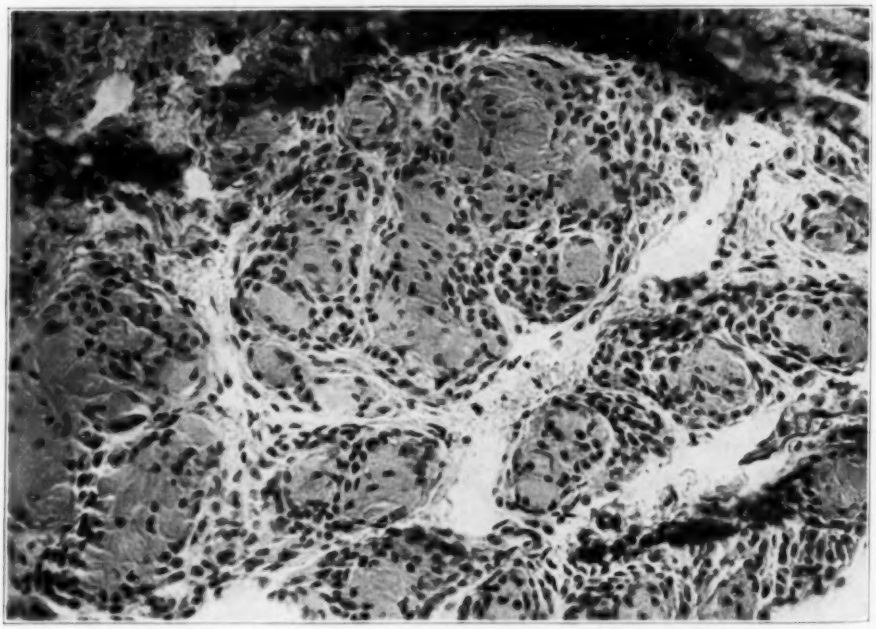

Fig. 3.—High power photomicrograph of part of figure 2. The nuclei of the cells are at the periphery of the islands, with the cell bodies constituting the center of the islands. Some of the cells are arranged in lamellae, simulating a tactile corpuscle of Meissner.

In connection with the latter nerve type of nevus, an article by Laidlaw and Murray [2a] is interesting. They advanced the hypothesis that pigmented nevi are rudimentary tactile corpuscles, like those found in reptiles. They found nevi in association with hair follicles and were able to trace nerve fibers into the masses of nevus cells. This theory may supply the correct explanation for the nerve type of nevi, but I cannot see how it explains the cellular types. Ewing,[3] Stout [4] and Foot [5] also supported the nervous origin of pigmented nevi. Foot also emphasized the necessity of using special staining methods in their study.

COMMENT

In attempting to visualize the formation of various types of pigmented nevi, I believe that the following ideas are as close as one may come at the present time, and they correspond essentially to the ideas of Masson. If one assumes that the clear cells have their origin in the sheath of Schwann, it would be necessary for them to migrate into the epidermis. A disturbance of development during their migration, resulting in multiplication of the elements, could result in the nerve type of nevus. A disturbance of development or benign neoplasia of the clear cells after they are attached to the epidermis would result in the cellular type of nevus. A combination of these two processes in varying degree could explain all of the types of pigmented nevi. Masson also artificially produced tumors similar to the nerve type and described similar spontaneous tumors as "schwannomas" of the palate, cervical region and forearm.

While it may be premature, I believe that it is not unjustifiable to classify pigmented nevi tentatively as schwannomas. It will be advantageous to discontinue the use of the terms "nevus" and "nevoid," since the various lesions which have been labeled nevi can be classified more accurately. The use of the ambiguous terms "nevus" and "nevoid" to designate a disturbance of development could be easily avoided by substitution of the term "prenatal."

I have suggested [6] that pigmented nevi be classified as "benign melanomas." There may be criticism of this designation, but in certain

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2a. Laidlaw, G. F., and Murray, M. K.: Melanoma Studies: III. A Theory of Pigmented Moles. Their Relation to the Evolution of Hair Follicles, Am. J. Path. **9**:827 (Nov.) 1933.

3. Ewing, J.: Neoplastic Diseases, ed. 3, Philadelphia, W. B. Saunders Company, 1928.

4. Stout, A. P.: Human Cancer, Philadelphia, Lea & Febiger, 1932.

5. Foot, N. C.: On the Silver Impregnation of Melanotic Tumors, Am. J. Path. **7**:619, 1931.

6. Becker, S. W.: Melanotic Neoplasms of the Skin, Am. J. Cancer **22**:117 (Sept.) 1934.

instances the tumors have the characteristics of benign neoplasms. One of the most interesting and least understood of malignant tumors is the malignant melanoma. This has been discussed in detail by Miescher,[7] Becker [8] and others on the basis of modern studies of pigment. The idea that melanoma usually originates from preexisting nevi and especially from nevus cells is erroneous. Most malignant melanomas originate from preexisting lentigines of the malignant type (75 per cent in Miescher's series). When melanomas originate from preexisting nevi, it is from melanoblasts at the epidermodermal junction and not from nevus cells. This idea is not universally accepted, but careful study by appropriate methods has convinced me of its correctness. The fact that melanoblasts do not originate from the epidermis, with the presence of melanocarcinoma and melanosarcoma types in the same primary tumor, encourages the use of the term "malignant melanoma" for the designation of these tumors. This term is gradually being used by a majority of pathologists. The malignant cell differs from the normal cell and those involved in benign proliferation by the presence of anaplasia and a marked change in the content and arrangement of the pigment (the pigment is in granules varying in size from dustlike particles to large masses). The amount of pigment has no relation to the rapidity of the growth, since I have seen rapidly growing lesions which were coal black, and slowly growing ones which contained little pigment. The so-called nonmelanotic melanoma probably does not exist, since a small amount of melanin can always be found if studied by the proper methods.

SUMMARY

Examination of several hundred pigmented nevi by modern histologic methods showed that they consisted of one or two types or a combination of both types. The first is the strictly cellular type, which results from the multiplication of the clear cells in the epidermis, with or without penetration into the dermis; the second is the nerve type, which is deeper and the structures of which often simulate those of tactile corpuscles. The use of the term "schwannoma," as suggested by Masson, is not illogical, although more work must be done before the origin of clear cells and nevi in the sheath of Schwann can be proved. The terms nevus and nevoid are ambiguous and could be replaced by the term prenatal without losing any of their significance.

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7. Miescher, G.: Die Entstehung der bösartigen Melanome der Haut, Virchows Arch. f. path. Anat. **264**:86, 1927.

8. Becker, S. W.: Cutaneous Melanoma, Arch. Dermat. & Syph. **21**:818 (May) 1930. Becker.[6]

GRANULOMA ANNULARE

REPORT OF AN UNUSUAL CASE

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Although there is an abundance of literature on the cutaneous manifestations of granuloma annulare, little attention has been paid until recently to cases presenting lesions confined predominantly or exclusively to the subcutis (Jacobi [1]). Involvement of the scalp in granuloma annulare is apparently a rare finding. Graham Little [2] noted only two such instances in a review of forty-nine cases, and the lesions were all of the cutaneous variety. The tendency of granuloma annulare to spare the scalp does not seem to be confined to the cutaneous lesions alone, but apparently applies to the subcutaneous manifestations as well. Jacobi stated that the subcutaneous form has been observed on the palm, the flexor surfaces of the fingers, the dorsum of the foot and the forearm, but said nothing of its occurrence on the scalp. In view of these facts, the following case is reported because of the unusual character and distribution of its lesions.

REPORT OF CASE

History.—A boy, white, aged 2 years, was brought to the hospital on Feb. 9, 1934, with nodular lesions over the skull, left wrist and right tibia. The patient's mother related that the condition had its onset approximately five months prior to examination, with the appearance of a small, firm, indurated, not tender nodule over the flexor aspect of the left wrist. This gradually became larger until it reached the size of a silver dollar, following which it remained stationary. Three months before admission to the hospital, approximately five nodules were noticed over the left side of the scalp. These had not changed. Two months prior to examination a swelling was noted over the anterior aspect of the middle third of the right tibia. A physician was consulted, who took a biopsy specimen from this lesion and submitted it to the pathology department of the hospital for examination. Since the onset of the present illness, the child was said to have lost 3 or 4 pounds (1.3 or 1.8 Kg.) and to have become more irritable than usual. There were no other symptoms referable to the present disorder.

The history was essentially unimportant except for an attack of varicella. There was no history of rheumatism or of tuberculosis. Both parents were

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Studies and Contributions from the Department of Dermatology and Syphilology, University of Michigan Medical School, service of Dr. Udo J. Wile.

1. Jacobi, F., in Jadassohn, J.: Handbuch der Haut- und Geschlechtskrankheiten, Berlin, Julius Springer, 1931, vol. 10, pt. 1, p. 796.

2. Little, E. Graham: Brit. J. Dermat. **20**:213, 1908.

apparently well. An uncle by marriage died of pulmonary tuberculosis in a sanatorium shortly before the patient's birth.[6] There had been contact with members of his family, but none showed evidence of tuberculosis on examination in another hospital.

Examination.—The patient was a well developed, well nourished, white boy of 2 years, not acutely ill, who presented an eruption involving the scalp, left wrist and right tibia. On the scalp this consisted of approximately six subcutaneous nodules distributed over the left parietal bone and occiput. The lesions varied in size from that of a pea to that of a marble. They were cartilaginous, smooth and not tender, and gave the impression of being fixed firmly to the underlying tissues. The scalp overlying the lesions was freely movable and of normal appear-

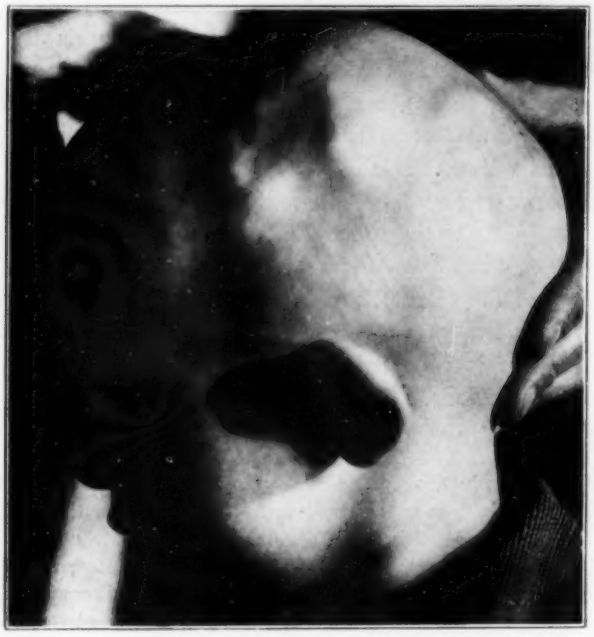

Fig. 1.—Multiple nodules of granuloma annulare confined solely to the subcutaneous tissue and superimposed by freely movable, normal-appearing scalp.

ance. Involving the flexor aspect of the left wrist was a roughly arcuate plaque approximately 2 cm. in diameter, exhibiting central involution. The border of the plaque was made up of several closely grouped, deeply seated, slightly elevated, whitish nodules of firm consistency the size of bird-shot. They were definitely situated in the skin, and were surrounded by a reddish areola. Over the middle third of the right tibia was a roughly oval, convex swelling the size of a half dollar. This protruded somewhat beyond the surrounding skin, was cartilaginous, not tender and firmly attached to the underlying tissues. Its surface was distinctly nodular on palpation, suggesting that it had resulted from fusion of smaller nodules. The overlying skin was freely movable and of normal appearance except for a scar where a biopsy specimen had been taken previously.

Roentgen-Ray Studies.—Examination of the skull revealed no abnormalities. There were no signs of involvement of bone in the vault. Studies of the upper and lower extremities were noncontributory. There were no tumors of bone or soft tissue visible in the films. Plates of the chest were negative. Studies of the neck and abdomen to demonstrate glandular structures revealed no grossly enlarged structures of soft tissue or abnormal calcium deposits.

Tuberculin Reactions.—Reactions were: negative to 0.1 cc. of 1:10,000, 1:5,000, 1:1,000, 1:100 and 1:10 dilutions of old tuberculin; negative to 0.01 mg. of tuberculin protein (tuberculin precipitation test), and positive to 0.1 cc. of undiluted old tuberculin and 1 mg. of tuberculin protein (tuberculin precipitation test).

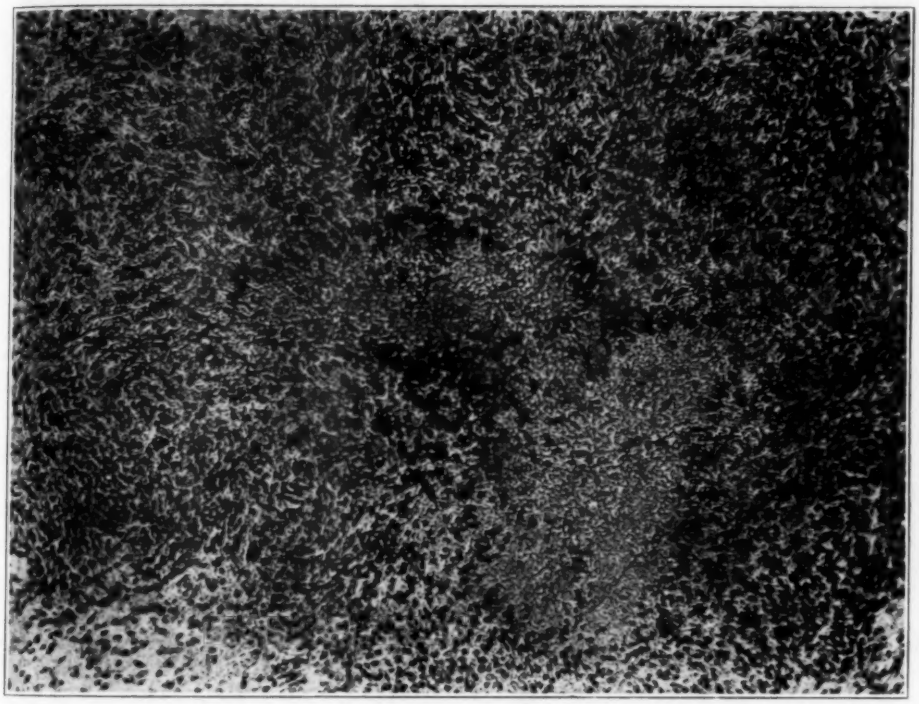

Fig. 2.—Low power magnification of a section of a subcutaneous nodule from the scalp, showing a histologic picture characteristic of granuloma annulare.

Histologic Examination.—A biopsy specimen of the lesion on the left wrist revealed epidermis with marked hyperkeratosis and slight acanthosis, but otherwise essentially normal. The papillary layer of the corium appeared normal except for numerous small groups of lymphocytes and occasional epithelioid cells which were distributed chiefly about the vessels. In the reticular portion of the corium were foci of coagulation necrosis surrounded by radiating strands of cells in almost palisade arrangement. The cells consisted principally of fibroblasts, though epithelioid cells and occasional lymphocytes were present. The remainder of the section showed showed a rather marked cellular infiltrate, again consisting chiefly of fibroblasts, scattered throughout the reticular layer and hypoderm and often distant from the foci of necrosis. The cellular elements were grouped par-

ticularly about blood vessels, hair follicles, coil glands and their ducts. No giant or plasma cells were seen. The vessels showed little if any change.

A transverse incision was carried down to the surface of one of the subcutaneous lesions of the scalp. The nodule was then freed by fine dissection. It was adherent to the pericranium, but not to the skin, did not appear to have a capsule and was relatively avascular and soft. Microscopic examination revealed a section which contained no attached epidermis and had the appearance of an unusual type of granuloma consisting of a dense cellular infiltrate composed of fibroblasts, epithelioid cells and, to a lesser extent, lymphocytes. Throughout the infiltrate were numerous foci of coagulation necrosis of the connective tissue, the fibers

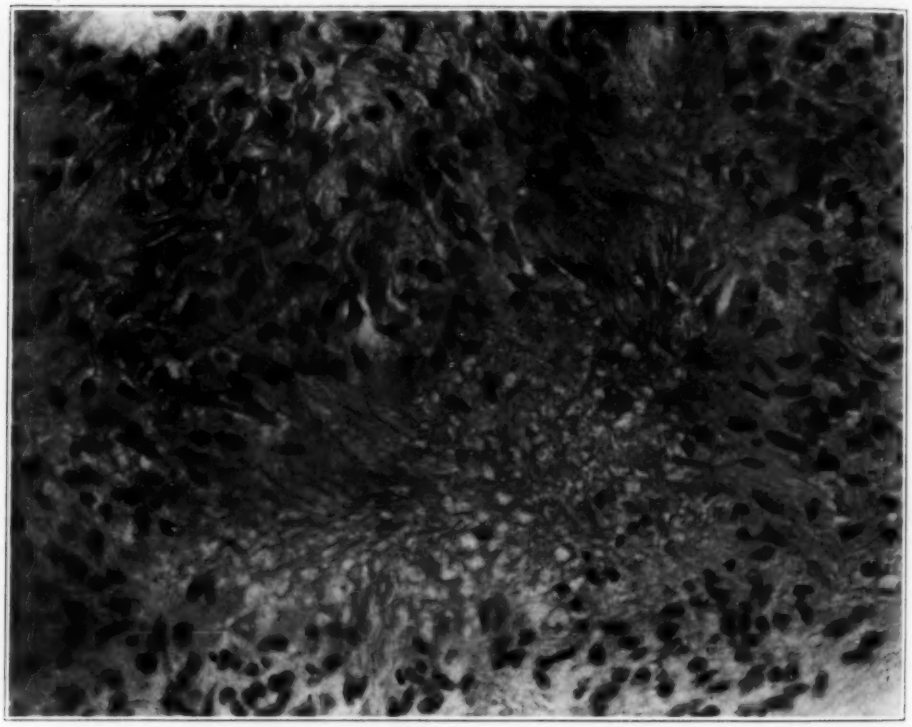

Fig. 3.—High power magnification of a section of a subcutaneous nodule from the scalp, showing a central focus of coagulation necrosis of the connective tissue surrounded by radiating strands of fibroblasts, epithelioid cells and lymphocytes in palisade arrangement.

appearing granular and fragmented and exhibiting a loss of sharpness of detail, hyaline changes and alteration in staining properties. Surrounding the areas of necrosis were radiating strands of cells, chiefly fibroblasts with a palisade arrangement. In places there was a rough attempt at division of the cellular infiltrate into circumscribed nodules by septums of collagenous fibers and elements of young connective tissue. No giant or plasma cells were seen, and the vessels appeared essentially unchanged except for moderate proliferation of the endothelium.

Examination of the biopsy specimen from the lesion over the right tibia revealed a picture similar to that of the lesion on the scalp.

Course.—The patient was entirely asymptomatic throughout his stay in the hospital. The prominence of the nodules over the scalp appeared to vary from time to time. Following the removal of a biopsy specimen the scalp lesions became relatively inconspicuous for several weeks, after which they reassumed their original form.

SUMMARY

1. A case of granuloma annulare with unusual subcutaneous lesions of the scalp is reported.

2. Although the association of subcutaneous nodules with typical cutaneous lesions of granuloma annulare is suggestive of their etiology, microscopic examination is necessary to establish their identity.

3. Except for a positive reaction to a tuberculin test with concentrated material, no evidence of tuberculosis could be found in spite of thorough clinical and roentgenologic investigation.

LICHEN NITIDUS

REPORT OF A GENERALIZED CASE

MAX S. WIEN, M.D.

AND

MINNIE OBOLER PERLSTEIN, M.D.

CHICAGO

Pinkus,[1] in 1907, first described lichen nitidus as a disease affecting males. Niles,[2] in a recent review of the literature, commented on the rarity of the condition in females, and stated that almost all cases reported in female patients have been of the confluent type. Highman,[3] in discussing a case presented by Maloney,[4] stated that the condition is more common among the Negro race. The condition, however, is apparently not as rare as is indicated in the literature, for in the transactions of the various dermatologic societies in the ARCHIVES OF DERMATOLOGY AND SYPHILOLOGY many cases are recorded of lichen nitidus occurring in both sexes and at different ages. The following case is reported because of the occurrence of generalized lichen nitidus in a white woman.

REPORT OF A CASE

A white woman, aged 50, presented an eruption of one year's duration, devoid of subjective symptoms. The eruption first appeared about both knees and elbows and gradually spread to involve the entire extremities. Both upper extremities from the middle third of the arms to the wrists presented an eruption consisting of small, grouped, shiny papules the size of a pinhead. The lesions had a yellowish waxy hue and retained their individual contours. The lower extremities (fig. 1) from the hips to the lower third of the legs presented discrete, follicular lesions the color of cayenne pepper, with minute hyperkeratotic central puncta that gave the sensation of a nutmeg-grater on palpation. The lesions were diffusely disseminated over the shoulders, breasts and abdomen.

The patient's general physical condition was good, and the physical examination gave essentially negative results.

Roentgen examination of the chest showed a slight increase in hilar markings, but no evidence of active tuberculous involvement. The Mantoux test (0.1 cc. of 1:10,000 old tuberculin) was positive. The Wassermann reaction of the blood was negative.

From the Dermatologic Service, Cook County Hospital.

1. Pinkus, F.: Ueber eine neue Knötchenförmige Haut Eruption, Behandl. d. Berl. dermat. Gesellsch. **85**:11, 1907.

2. Niles, H. D.: Lichen Nitidus, Arch. Dermat. & Syph. **22**:687 (Oct.) 1930.

3. Highman, W. J., in discussion on Maloney.[4]

4. Maloney, E.: Case of Generalized Lichen Nitidus, Arch. Dermat. & Syph. **28**:94 (July) 1933.

Fig. 1.—Lichen nitidus, showing diffuse involvement of the leg.

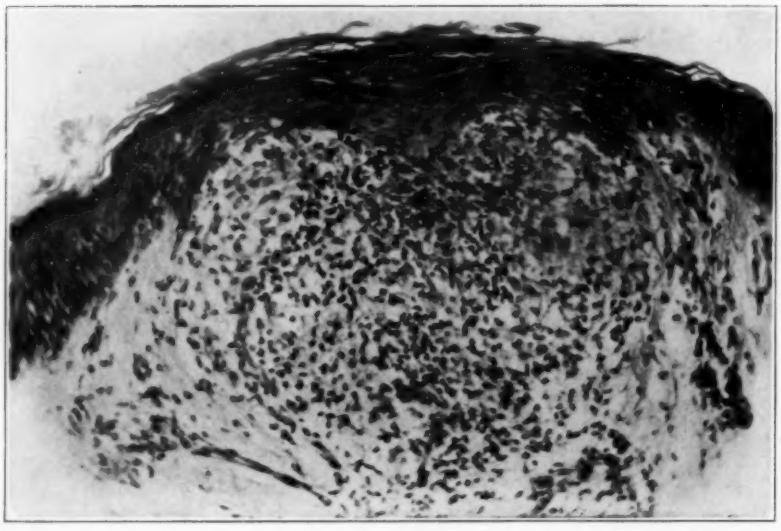

Fig. 2.—Section showing granulomatous nodule in the corium, with depressed epidermis over the nodule which is covered with a hornified scale; × 250.

The histologic examination was made by Dr. Jaffé. In the uppermost layer of the cutis, extending close to the basal layers of the epidermis, was a sharply circumscribed spherical granulomatous lesion, which consisted of a delicate cellular reticulum and small round cells of the lymphocytic type (fig. 2). The cells forming the reticulum had a pale-stained cytoplasm that extended into fine branched processes that were connected with the processes of the adjacent cells. The nuclei of the cells were oval and showed a finely granular chromatin structure, with single round cell nucleoli. The cells showed intimate relations to the adventitial cells of the capillary blood vessels, which were found especially in the periphery of the nodule.

Where the nodule reached the epidermis, the rete cells swelled and became loosened, and single lymphocytes could be seen between the rete cells. The nodule produced a slight elevation on the surface of the adjacent epidermis, the center of which was slightly depressed and covered with a small scale of hornified cells. The cutis about the nodule showed a slight edematous loosening, with swelling of the nuclei of the fibrocytes. The adventitial tissue of the adjacent vessels was more prominent and increased in amount.

SUPERFICIAL INTRA-ORAL APPLICATION OF ROENTGEN RAYS

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AND
A. FISHER, M.D.
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Stimulated by the results obtained with massive doses of roentgen rays used superficially in malignant conditions of the skin and lip, the doses for the lip conforming to the method advocated by Pusey, Martin,[1] Grier and others, we sought a method which would enable one to use the same energy within the oral cavity. Two years ago we began the superficial use of roentgen rays for this purpose. Although in January Stecher and Loughery [2] published a report on the "Direct Roentgen Irradiation of Intracavitary Neoplasms," our work was independent, and we had no knowledge of their efforts.

We believe that some of the results that we obtained with this method in intra-oral malignant conditions justify this communication.

To make certain that the application is effective, two important difficulties must be overcome: (1) the protection of the unaffected structures and (2) the stabilization of the affected part. For this purpose a special applicator was designed and so arranged that a suction vacuum could be applied to it. For this purpose the upper aperture of the applicator was covered with cellophane, and the lower opening was left open. At about the center of the shaft there is a small tube which leads into the lumen of the applicator, through which, by means of a rubber hose, suction is applied to hold the lesion to be treated in position.

Several different types of lesions were treated in this manner. For intra-oral malignancy the dose selected was 6,000 roentgens (r), which is equivalent to 17+ MacKee units or 8 skin erythema doses.[3] This dose was delivered over a period of one week and in two or three sittings. The reaction which follows a dose of this strength is acute and blistering; it causes a marked inflammatory reaction and is followed by a definite destruction of cells. At times it is necessary to repeat the dose

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From the Pittsburgh Skin and Cancer Foundation.

1. Martin, C. L.: Squamous Carcinoma of the Skin, Am. J. Roentgenol. **28**:728, 1932.

2. Stecher, W. R., and Loughery, T. P.: Direct Roentgen Irradiation of Intracavitary Neoplasms, Am. J. Roentgenol. **31**:64, 1934.

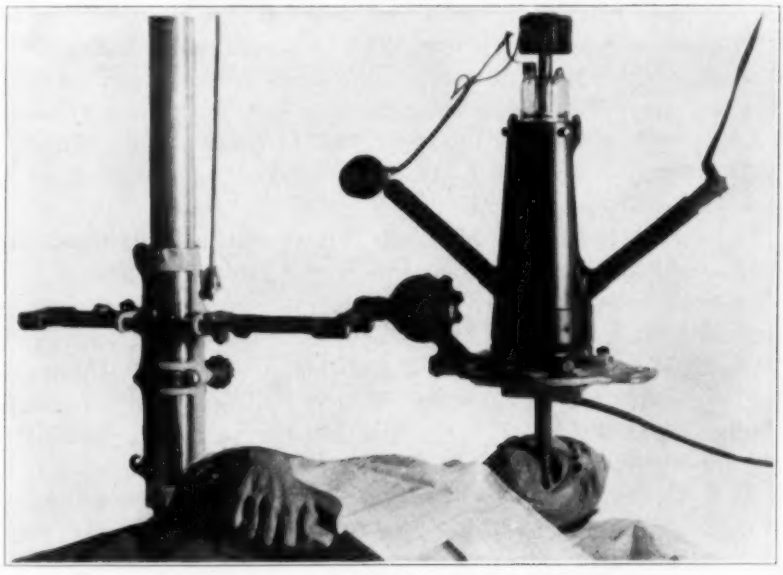
3. Andrews, G. C., and Braestrup, C. B.: Skin Erythema Dose in Terms of Roentgens in Superficial Therapy, Am. J. Roentgenol. **34**:663, 1933.

after the inflammation subsides, in five or six weeks, or to supplement this treatment with an interstitial application of radium. This modality is still of sufficient value to make it an important adjunct to the treatment of malignant growths.

In some cases of carcinoma of the lip one can find an excellent use for this applicator. This is true when the inner surface of the lip is affected. An exceedingly good result was thus obtained in a tumor of the upper lip.

REPORT OF CASES

CASE 1.—W. S. R., aged 66, presented a tumefaction just above the right angle of the mouth. It was indurated and well defined and involved the skin and the



Applicator in place for intra-oral roentgen rays.

underlying tissues. The diameter was 4 by 2.5 cm. At the inferior portion a small, crust-covered ulcer was present. Several months before examination it was excised, and a diagnosis of epidermoid carcinoma was made. The tumor recurred.

After the badly infected mouth was cleansed, the patient was subjected to three courses of roentgen rays, of 6,000 r each, the application being made through the inner surface of the lip. The end-result was exceedingly satisfactory. Tumefaction, induration and external ulceration disappeared. The patient then received high voltage irradiation of the cervical glands. At present he is without symptoms.

Another location admirably adapted to the use of this procedure is the mucous membrane opposite the angle of the jaw.

CASE 2.—J. F., aged 48, presented a hypertrophic, whitish tumefaction in this area. The condition began three years before admission, when a clinical diagnosis

of leukoplakia was made, but on examination of a section the lesion proved to be an epidermoid carcinoma. It was destroyed by electrodesiccation, but recurred. Interstitial application of radium was then used. Six months later the condition returned. It was then that two courses of intra-oral superficial irradiation, of 6,000 r each, were given one month apart. The result was exceedingly gratifying, and there was no recurrence of the lesion in the subsequent eighteen months.

Temporary results in carcinoma of the pharynx or in sarcoma of the pharynx can be obtained, and, especially in sarcoma of the pharynx, the tumefaction disappears readily. Roentgen rays are the most easily tolerated form of treatment that can be given, although the final results remain as unsatisfactory as heretofore. This conclusion is drawn from the fact that practically all of the cases of pharyngeal carcinoma which we have seen thus far were associated with extensive involvement of the lymph nodes.

We have treated a number of patients with carcinoma of the tongue with this modality. A typical example is the accompanying case.

CASE 3.—I. H., aged 69, showed at the junction of the middle and second third of the tongue a sharply demarcated, stony-hard lesion, 2 by 1 cm. in diameter. There was involvement of the lymph nodes in the submaxillary region. The patient had used tobacco for forty-one years previous to admission, and his oral hygiene was bad. Six thousand roentgens caused a marked inflammatory reaction, after which the tumefaction disappeared. Radon seeds were then implanted in the tongue and the submaxillary areas, and thus far (twelve months later) the patient is apparently in a fair condition.

We have used the intra-oral application of roentgen rays in a case of epulis and obtained satisfactory results.

Further experience, of course, is necessary to work out many details in conjunction with this modality and also to determine its use in leukoplakia and resistant lichen planus of the oral mucosa, but we believe that sufficiently good results have been obtained to permit this communication.

SUMMARY

A new applicator for the intra-oral use of roentgen rays is described, suction being utilized as a method of fixation of the lesions.

631 Jenkins Building.

NECROBIOSIS LIPOIDICA DIABETICORUM

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AND
MARCUS RAYNER CARO, M.D.
CHICAGO

In 1929, Oppenheim [1] presented the case of a man with diabetes who exhibited coin-sized, firm, flat red papules with a yellowish center, distributed chiefly over the legs and sparsely on the trunk and upper extremities. Some of the older and larger lesions presented an irregular reddish-brown border and a whitish wrinkled atrophic glistening center. Histologically there were necrobiotic areas in the corium in which the elastic fibers were absent and the collagen fibers swollen. The latter were stained with sudan III, but showed no double refraction. Oppenheim believed that the metabolic disturbance of diabetes mellitus produced a transformation of the collagen and elastin into lipoid, and he named the disorder dermatitis atrophicans lipoides diabetica.

In 1932, Urbach [2] presented a second case in a woman who had diabetes with similar clinical and histologic features, and gave the disorder the name of necrobiosis lipoidica diabeticorum. The lesions were chiefly below the knees, and they consisted of irregularly shaped, circumscribed, hard flat papules, bluish violet at the border and yellow at the center. The older patches were scaly and were covered by a thin epidermis traversed by dilated blood vessels. Urbach showed that there was a profound alteration in the vessels of the corium leading to necrosis and followed by a deposition of fatty substances in the necrotic tissue. Double refraction was not demonstrated. Urbach explained the pathogenesis on the basis of a primary tissue necrobiosis resulting from toxins due to diabetes mellitus, followed by an infiltration of the necrotic tissue by lipoids present in excess in the circulating blood of diabetic patients.

From the Department of Dermatology, Michael Reese Hospital, and the Mandel Clinic.

Read before the Section on Dermatology and Syphilology at the Eighty-Fifth Annual Session of the American Medical Association, Cleveland, June 13, 1934.

1. Oppenheim, M.: Ueber eine bisher nicht beschriebene mit eigentümlicher lipoider Degeneration der Elastica und des Bindegewebes einhergehende chronische Dermatose bei Diabetes mellitus (Dermatitis atrophicans lipoides diabetica), Arch. f. Dermat. u. Syph. **166**:576 (Oct.) 1932.

2. Urbach, E.: Eine neue diabetische Stoffwechseldermatose: Nekrobiosis lipoidica diabeticorum, Arch. f. Dermat. u. Syph. **166**:273, 1932.

In 1933, Balbi [3] reported a case in a man with severe diabetes accompanied by an excess of total lipoids, cholesterol and phosphatides in the blood. The lesions were more generalized, occurring on the back of the hands, the lower one third of the arms and the thighs as well as on the legs. They showed a sulphur-yellow center and a rose-brown border, and in many of them central ulceration developed. Microchemical examination demonstrated the presence of phosphatides and neutral fats. Histologic studies showed the characteristic necrobiotic areas, inflammation and thickening of the deeper vessels associated with thrombosis, and deposits of lipoids in the walls of the vessels. According to Balbi the intense vascularitis was the primary cause of the deposition in the adjacent tissues of the excess lipoids in the blood.[4]

In the following two cases the patients came under our care almost simultaneously as having the first cases identified in the United States of this new dermatosis of lipoid and carbohydrate metabolism.

REPORT OF CASES

CASE 1.—*History.*—E. A., a white man, aged 27, was first seen at the Michael Reese Hospital in May 1933. Diabetes mellitus had been present for about six years and, while he had received a diet low in carbohydrates and had taken insulin for a short period, for the past four years he had been careless in the management of the diabetes. Lesions first appeared on the legs about two and a half years previously, and slowly increased in size and number. There was no pain or itching.

Physical Examination.—Physical examination gave essentially negative results except for the skin lesions and a yellowish hue on the palms. On the anterior and lateral aspects of both legs were many roughly symmetrical, round or oval circumscribed papular lesions, some of which coalesced to produce patches with a polycyclic border. The lesions varied from the size of a dime to that of a dollar and had a nonelevated border which was firm and scleroderma-like in consistency and a slightly depressed atrophic center. The color varied from a light yellowish brown at the border to a darker russet brown in the center, and did not fade on pressure. The surface was smooth and glistening except for an occasional slight dry scaling, and beneath the thin epidermis many dilated blood vessels could be seen. In several of the lesions there were small atrophic depigmented scars in the center. The lesions were not tender on pressure.

Laboratory Examination.—On admission to the hospital on May 17, urinalysis revealed: volume, 2,520 cc.; specific gravity, 1.026; acid; acetone, 3+; sugar, 176.92 Gm.; nitrogen, 20.93 Gm., and albumin, 0. The blood count showed: red cells, 4,730,000; hemoglobin, 80 per cent; white cells, 12,300; polymorphonuclears, 68 per cent; eosinophils, 3 per cent; lymphocytes, 26 per cent; transitionals, 3 per cent. Chemical examination of the blood revealed: sugar, 386 mg. per hundred

3. Balbi, E.: Ricerche intorno alla patogenesi della necrobiosis lipoidica diabeticorum Urbach-Oppenheim, Gior. ital. di dermat. e sif. **74**:14 (Feb.) 1933.

4. Since the publication of these reports a number of additional cases have been demonstrated before dermatologic societies; one by Galewsky (Dresden), three by Krenn (Vienna), one by Klaber (London) and two by Michelson (Minneapolis).

cubic centimeters; nonprotein nitrogen, 41 mg.; uric acid, 4.6 mg.; chlorides, 445 mg.; cholesterol, 310 mg.; calcium, 10.2 mg.; carbon dioxide-combining power, 44.2 volumes per cent, and total fatty acids, 626.6 mg. The Wassermann and Kahn reactions of the blood were negative. On successive days the basal metabolic rate was minus 4.6, plus 21.6 and plus 16.7.

A roentgenogram of the legs revealed no calcification of the blood vessels, and one of the chest showed no abnormal changes in the heart or lungs. An electrocardiogram suggested myocardial involvement. Ophthalmologic examination revealed normal fundi.

Histologic Examination.—Histologic examination of a biopsy specimen taken from the center of a lesion on the anterior surface of the right leg (hemalum and

Fig. 1 (case 1).—Necrobiosis lipoidica diabeticorum. The symmetrical character of the eruption is evident. The erythema surrounding the lesion on the lower part of the left leg is due to exposure to ultraviolet rays.

eosin) revealed flattening of the epidermis with a loss of rete pegs, slight intracellular and intercellular edema, a thin loose scale, a continuous granular layer and an intact basal layer. In the upper part of the corium several blood vessels were widely dilated, but showed no perivascular infiltration. Most of the superficial vessels, however, those of the deeper corium and several in the hypoderm showed evidence of severe inflammation. The walls of the vessels were thickened and showed proliferation of the intima and occasionally thrombosis, and they were surrounded by dense mantles of infiltration composed largely of lymphocytes and histiocytes. About the vessels and profusely scattered throughout the upper part of the corium were many fine brown granules of pigment which proved to be hemosiderin (prussian blue).

In the deeper part of the corium lay several poorly defined, horizontally elongated zones of necrobiosis. In these the collagen fibers were thick, parallel and wavy, and they were densely packed together. The fibers were homogeneous, and stained poorly (Van Gieson). Within the areas the elastic fibers were absent (Weigert), while in the intervening tissue they were fragmented, sparse and clumped.

When stained with sudan III, the thickened fibers in the necrobiotic areas showed a diffuse light brownish-red color. Between them were longitudinal rows

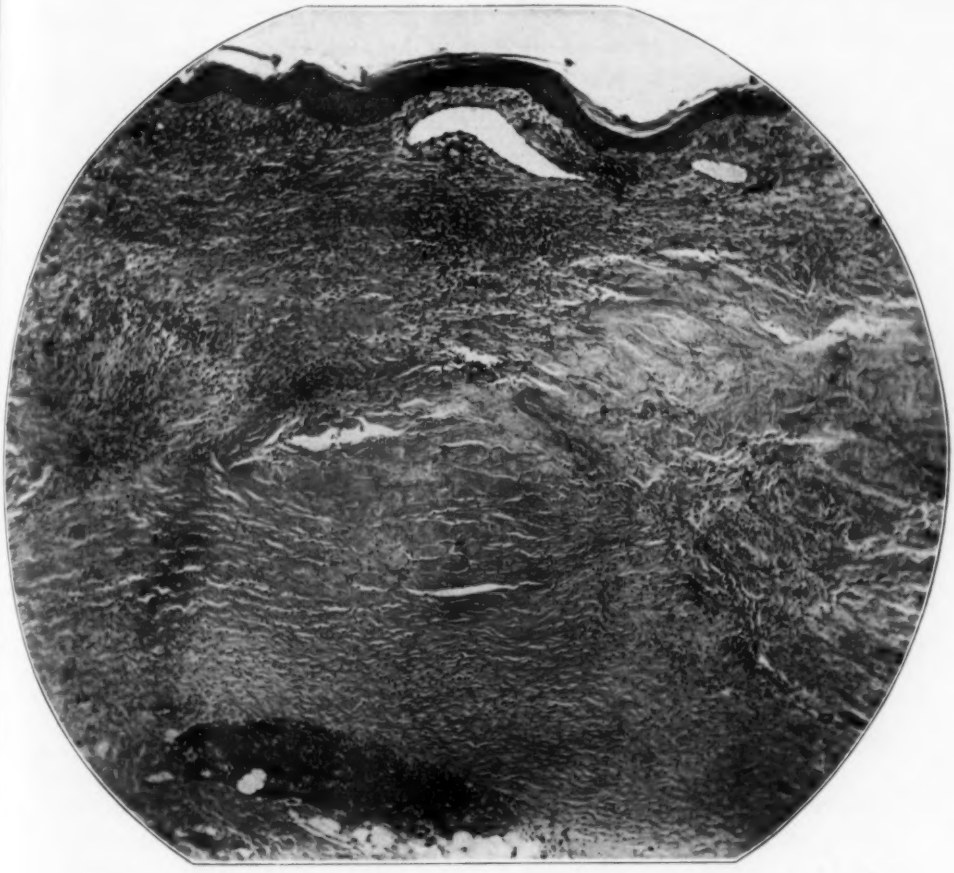

Fig. 2 (case 1).—The epidermis is flattened, the superficial vessels are dilated and there are areas of necrobiosis in the corium and a dense cellular infiltration about a deep vessel. Hemalum and eosin; × 40.

of tiny bright orange-red droplets. No foam cells and no intracellular sudanophilic droplets were seen. The subcutaneous tissue and the scale stained bright orange-red. Polariscopic examination revealed no doubly refracting bodies. Neither amyloid nor calcium (Kossa) was found.

Investigations.—The patient was given a diet free from fat, and a test for tolerance of lipoids was performed. Five grams of cholesterol in 100 cc. of olive

oil was given by mouth on an empty stomach; chemical examinations of the blood revealed the following:

	Cholesterol, Mg.	Fatty Acids, Mg.	Phospholipids, Mg.
8:30 a. m.	350	534	12.1
12:30 p. m.	343	630	14.6
8:30 p. m.	535	674	20.5
8:30 a. m.	355	645	13.3

The figures show a maximal increase at the end of twelve hours of 52.8 per cent for cholesterol, 26.2 per cent for total fatty acids and 69.4 per cent for phospholipids. At the end of twenty-four hours the concentration of fatty acids had not returned to the original figure, as would normally occur. The exact significance of the cholesterol tolerance tests is open to question. Chaikoff, McGavack and Kaplan [5] showed that the ingestion of 100 cc. of olive oil alone by normal subjects may cause a maximum increase up to 35 per cent in the blood lipoids over a ten hour period of observation. In six of seventeen normal subjects the ingestion of fat had no appreciable effect on the cholesterol level of the blood. In a patient with xanthomatosis the response of the blood lipoids to the ingestion of 100 cc. of olive oil showed no abnormality, as compared with normal subjects.

Chemical examination of a piece of skin taken from one of the lesions of the right leg was performed by Dr. D. J. Kooyman, with the following results:

	Moist	Dry, Extracted
Weight of specimen	0.334 Gm.	0.0675 Gm.
Total lipoids	6.21 per cent	30.7 per cent
Total cholesterol	0.554 per cent	2.74 per cent
Phospholipids	0.397 per cent	1.96 per cent

According to Dr. Kooyman the figures show a tremendous increase in the lipoid content of the necrobiotic skin over that of normal skin.

Insulin was injected under several lesions on the left leg without demonstrable improvement. One was treated by sixteen weekly exposures of one-fourth erythema dose of roentgen rays without benefit. Several lesions on the left leg were treated by weekly exposure to ultraviolet rays from a water-cooled quartz mercury vapor arc lamp to produce a severe reaction. There were gradual paling and thinning of the lesions following exfoliation due to the ultraviolet rays. In one, in which a severe reaction with ulceration occurred, the lesion seemed almost to have disappeared after healing took place. However, after treatment was discontinued for several months the lesions resumed their original appearance.

An unsuccessful attempt was made to produce a lesion artificially on the normal skin of the abdomen by exposing an area repeatedly to ultraviolet rays from a water-cooled quartz mercury vapor arc lamp. It was hoped to produce necrosis of the collagen fibers by the action of intense ultraviolet irradiation, followed by the infiltration of the necrotic areas by lipoids from the circulating blood. The reduction of the lipemia by antidiabetic treatment at the time this experiment was being carried out may have been a factor in the failure to produce a lesion. The experiment should be repeated in a patient with necrobiosis lipoidica diabeticorum before bringing the diabetes and lipemia under control.

Course.—During the year that the patient has been under our observation there has been no apparent change in any of the lesions in spite of the control of the diabetes by diet and insulin. No new lesions have appeared. The diet has varied

5. Chaikoff, McGavack and Kaplan: The Blood Lipids in the Postabsorptive State and After Ingestion of Fats in Normal Human Subjects and in a Case of Disseminated Cutaneous Xanthomata, J. Clin. Investigation **13**:1 (Jan.) 1934.

from one containing 70 Gm. of protein, 145 Gm. of fat and 125 Gm. of carbohydrate to one with 70 Gm. of protein, 100 Gm. of fat and 125 Gm. of carbohydrate. The caloric intake varied from 2,130 to 1,680 calories. Insulin was given daily in doses of from 30 to 60 units.

CASE 2.—*History.*—I. B., a Jewish woman, aged 72, was admitted to Michael Reese Hospital on June 28, 1933, with a generalized vesicular eruption, bleeding from the mouth, epistaxis and conjunctivitis of about two months' duration. The presence of diabetes mellitus had been known for about ten years, and she had been under dietary treatment without the use of insulin. A patch different from the rest of the eruption was noticed on the left foot. According to the patient

Fig. 3 (case 2).—Necrobiosis lipoidica diabeticorum. There was only a single lesion, on the left ankle.

this had appeared many years before and had enlarged slowly, never giving rise to symptoms.

Physical Examination.—The patient presented a typical picture of pemphigus vulgaris, with many vesicles and bullae arising from normal skin and many eroded and crusted lesions. There were also bloody crusted lesions on the nasal septum, ulcers and white desquamating patches in the mouth, small ulcers on the pharynx and severe purulent chronic hypertrophic conjunctivitis with ectropion of both lower lids.

On the outer surface of the left foot just below the malleolus there was a circumscribed ovoid patch, the size of a dollar, slightly elevated and having a peculiar scleroderma-like induration (fig. 3). The color was light purplish brown in the center, becoming more yellowish toward the border.

Laboratory Examination.—Urinalysis revealed: specific gravity, 1.018; a faint trace of albumin; sugar, 4+, and acetone, 2+. The blood count showed: red cells, 4,580,000; hemoglobin, 80 per cent; white cells, 8,100; polymorphonuclears, 46 per cent; lymphocytes, 47 per cent, and transitionals, 7 per cent. Chemical examination of the blood revealed: sugar, 275 mg. per hundred cubic centi-

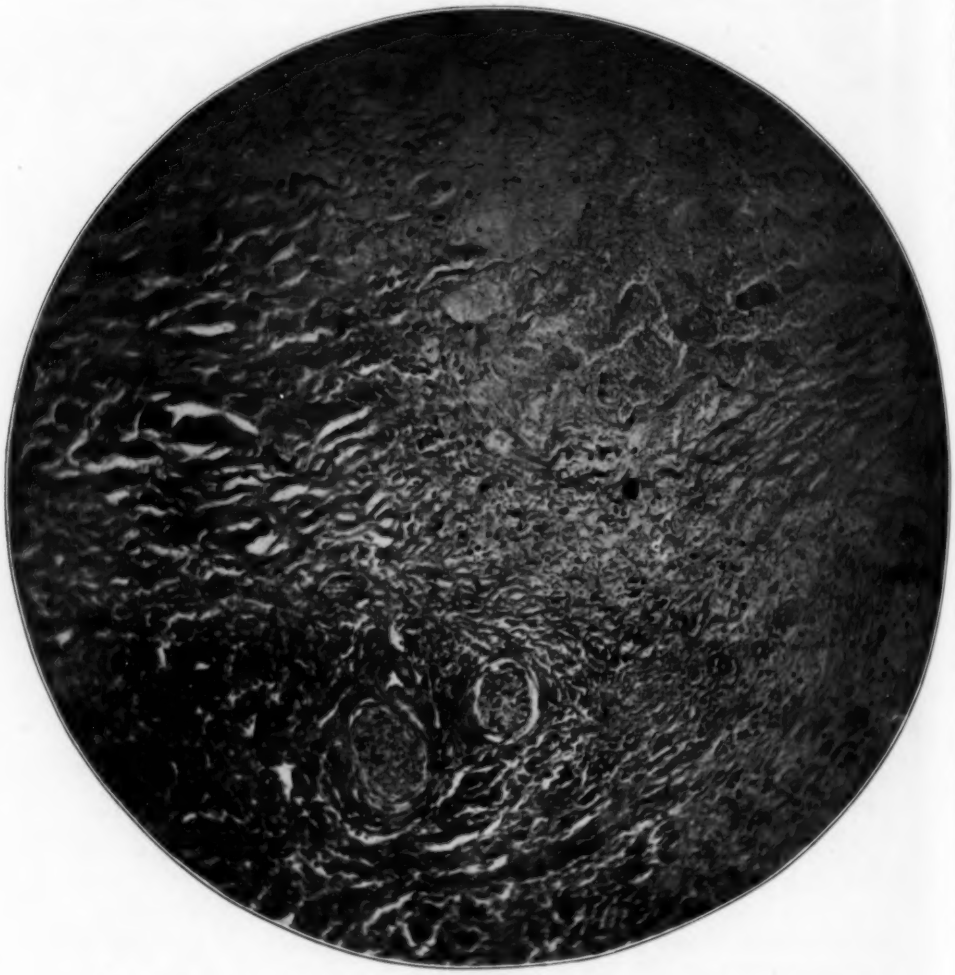

Fig. 4 (case 2).—The collagen fibers are swollen and stain poorly and the obliterated blood vessels are surrounded by a dense cellular infiltration. Van Gieson; × 90.

meters, and nonprotein nitrogen, 37 mg. Another examination revealed: sugar, 162 mg.; cholesterol, 379 mg.; fatty acids, 933.4 mg.; nonprotein nitrogen, 34 mg.; serum albumin, 1.56 per cent; serum globulin, 1.6 per cent, and carbon dioxide-combining power, 50 volumes per cent. The Wassermann and Kahn reactions of the blood were negative. The phytopharmacologic test of the blood performed by Dr. I. R. Pels was 41 per cent, which was a highly toxic reading diagnostic of pemphigus.

Ophthalmologic examination revealed normal fundi.

Histologic Examination.—A biopsy specimen taken from the lesion on the foot showed changes more marked than those in case 1. The epidermis (hemalum and eosin) was essentially normal except for a slight intracellular and intercellular edema. While some of the blood vessels were dilated, most of them showed proliferation of the intima, often to the point of occlusion of the lumen. About the vessels the infiltration was massive and especially profuse in the upper part of

Fig. 5 (case 2).—The elastic fibers are absent in the necrotic areas and they lie as horizontal clumps of fragments in the intervening tissue. Weigert; × 100.

the corium and was composed largely of lymphocytes and histiocytes with a few eosinophils. Throughout the corium, but especially in the deeper part, lay many poorly defined areas of necrobiosis which were relatively acellular. The collagen fibers were pale, greatly swollen, wavy and densely packed and showed a peculiar granular degeneration. The granular fibers did not take the Van Gieson stain, while the intervening wavy collagen fibers stained poorly. The elastic fibers were absent in the necrotic areas (Weigert) and in the zones of infiltration in the upper part of the corium, and were present as strands of clumped fragments in the

intervening tissue. The prussian blue stain showed a few granules of hemosiderin clumped about some of the blood vessels.

Staining with sudan III demonstrated two types of change. The granular fibers in the necrobiotic areas were stained a dull brownish red. Between them and in the adjoining tissue were many small bright orange-red droplets, most of them extracellular but some present within histiocytes which resembled the foam cells of xanthoma. Giant cells were not found. Polariscopic examination revealed no doubly refracting bodies. Neither amyloid nor calcium was found.

Course.—The patient was transferred to the Research and Educational Hospital of the University of Illinois. The pemphigus followed a downward course in

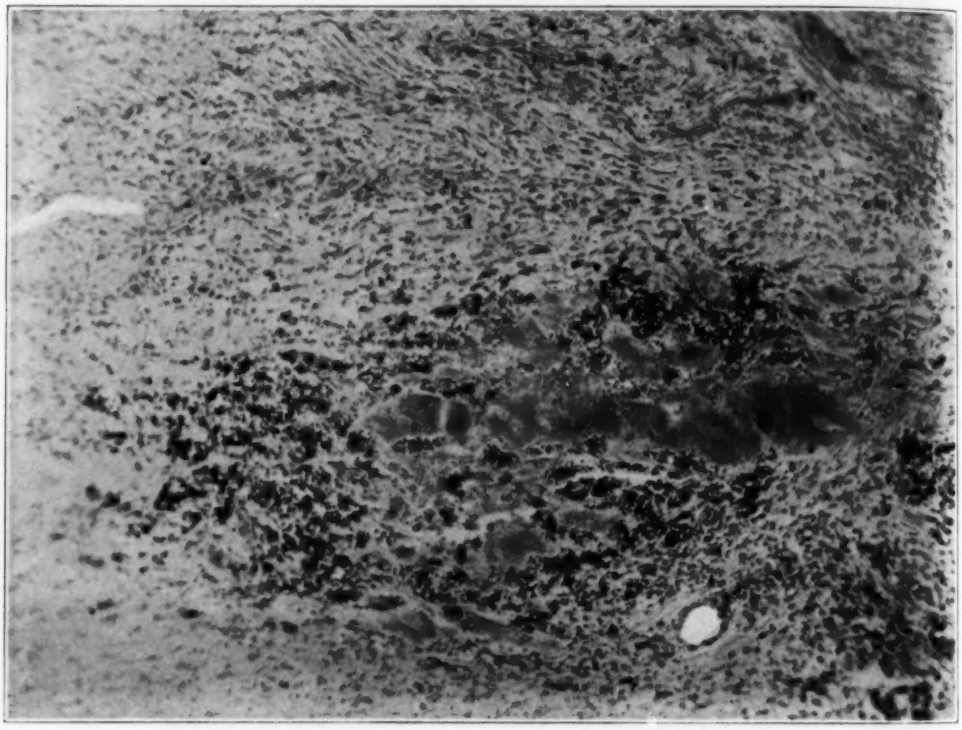

Fig. 6 (case 2).—The swollen necrotic collagen fibers are granular and stain a dull reddish brown. Between and about them lie many bright orange-red droplets, many of them extracellular, but some lying within histiocytes. Sudan III; × 50.

spite of treatment, which included the Davis treatment, solution of potassium arsenite and large doses of a solution of ergosterol by mouth. At one time, when pharyngeal involvement made feeding by mouth impossible, 1,000 cc. of a 5 per cent solution of dextrose was given intravenously twice a day. There was a sudden improvement in the pemphigus, and most of the lesions of the skin and mucous membrane were healed within a few days. Two weeks later the patient suffered a relapse, however, and the pemphigus lesions became progressively more extensive until death, which occurred on September 22. No change was noted in the patch of necrobiosis during the time the patient was under our care.

Necropsy.—Necropsy, performed by Dr. George Milles, showed, in addition to the cutaneous changes: extreme fatty and fibrous atrophy of the pancreas; congestion, parenchymatous degeneration and marked fatty infiltration of the liver; arteriosclerosis of the kidneys; marked sclerosis and intimal proliferation of the aorta and abdominal vessels; old healed tuberculosis of the apex of the right lung, and bilateral fibrous pleurisy.

CLINICAL DESCRIPTION

The primary lesion in necrobiosis lipoidica diabeticorum is a round or oval, smooth, glistening, firm papule embedded in the skin, which enlarges gradually and becomes a plaque. The original color is some shade of yellow, with a later admixture of brown, red or violet. In its further development two zones can be distinguished, a central zone which has a peculiar buff or russet color and a lighter yellow or yellowish-brown narrow border, as seen in our first case. In the other recorded cases the color has varied from a bluish violet at the periphery and a yellow center (Urbach) to a combination of yellow and brown in the center and a wine-colored border (Balbi). The shades of color are probably due to the amount of lipoids deposited in the connective tissue, to secondary changes such as the deposition of hemosiderin, and to the varying degrees of stasis in the underlying blood vessels. A gradual increase in the size of the lesions and a tendency to coalescence are noticeable. The surface is smooth, glistening and level with the surrounding skin.

The peculiar scleroderma-like lesions may, in the course of months, be transformed into a central atrophic zone, with thinning of the epidermis and fine scaling. Ulceration of the center of the lesions has been observed in one case (Balbi). The favorite location of the eruption is below the knees in a roughly symmetrical pattern. The thighs and upper extremities were involved in only two cases. The number varies from a single isolated lesion to several dozen. Subjective symptoms are absent. Age and sex apparently play no rôle. The course is chronic and the disease is resistant to all forms of therapy. All the cases so far reported have been in patients suffering from diabetes mellitus with associated lipemia.

DIFFERENTIAL DIAGNOSIS

From the five recorded cases sufficient clinical and histologic criteria should be available to serve for a differential diagnosis from similar cutaneous disorders. The peculiar yellowish color suggests the possibility of some form of xanthoma. The cutaneous lesions of xanthomatosis are regarded as part of a constitutional disorder of the lipoid metabolism in which a deposition of fatlike substances, chiefly cholesterol and its esters, takes place in the reticulo-endothelial cells of the skin.

Clinically, it is characterized by uniformly sulphur-yellow nodules or plaques occurring at sites of trauma, such as the elbows, knees and palms. Histologically there are characteristic xanthoma or foam cells which are loaded with intracellular double refracting lipoids, and in the later stages there is a marked fibrous and foreign body giant cell reaction. A special variety of xanthoma which clinically resembles necrobiosis is the rare condition described as xanthoma areolare multiplex by Riehl and Arzt,[6] in which there are raised brownish-red plaques which undergo central regression and atrophy.

In the acute eruptive type known as xanthoma diabeticorum, which occurs in obese diabetic persons, there are discrete conical reddish papules with yellow or cream-colored summits and a predilection for the extensor surfaces of the elbows, knees and buttocks. These can be made to disappear rapidly by treatment which controls the diabetes.

Another rare disturbance of the lipoid metabolism is represented by the extracellular cholesterosis of Urbach.[7] In this condition there is a generalized eruption of small, hard, scaly, reddish-brown nodules on the skin, with similar lesions of the mucous membrane. The diagnostic pathologic change is the extracellular deposition of cholesterol and its esters about the vessels and throughout the corium.

The predilection of the eruption for the lower limbs suggests the possibility of localized amyloidosis. In this disorder there are firm, brown, often translucent, grouped papules which are stained red by the subcutaneous injection of congo red (Nomland). Histologically there are homogeneous masses in the papillary and subpapillary layers which give positive stains for amyloid.

In their scleroderma-like consistency the lesions of necrobiosis simulate localized scleroderma or morphea. In typical cases of the disease there are oval or bandlike ivory-white or lardaceous areas with a lilac border which are quite different from the varicolored yellow to brown plaques of necrobiosis. Histopathologic examination reveals a distinctive homogenization of the connective tissue without lipoid infiltration.

Other conditions that should be differentiated are erythema induratum, acrodermatitis chronica atrophicans and localized myxedema.

PATHOGENESIS

The observations recorded here largely confirm the conclusions reached by Urbach and Balbi. We are in agreement with the conception of necrobiosis lipoidica diabeticorum as a disturbance of the fat

6. Riehl and Arzt: Ein Fall von Xanthoma Areolare Multiplex, Arch. f. Dermat. u. Syph. **119**:153, 1914.

7. Urbach, E.; Epstein, E., and Lorenz, K.: Extrazelluläre Cholesterinose, Arch. f. Dermat. u. Syph. **166**:243, 1932.

metabolism in which the excess of lipoids present in the blood of diabetic patients is deposited (Urbach used the term imbibition) in the necrobiotic connective tissue of the skin. The peculiar histologic and histochemical observations, the inflammatory vascular changes, the swollen granular and fatty condition of the collagen and the grapelike and beadlike arrangement of the droplets of fat can best be explained on the basis of an injury to the tissues caused by toxic substances produced by the diabetic disease acting on the blood vessels of the skin. Balbi was able to demonstrate, histologically, concentric deposits of lipoids around the thrombotic vessels of the skin. Undoubtedly the disturbed quantitative relationship of the blood lipoids, as indicated by the increase of cholesterol, total fatty acids and phospholipids in the blood, is dependent on the underlying diabetes, and leads to the deposition around the blood vessels of one or more of the lipoid constituents. The quantitative chemical estimation showing a great increase of all the lipoid constituents of the affected skin as compared with normal skin lends support to this view.

While no intracellular lipoids were found in our first case, our second differed in this respect from cases previously recorded. In addition to the lipoid infiltration of the necrobiotic collagen, many histiocytes were also infiltrated by droplets of lipoid.

The nature of the deposited lipoid has not been positively identified but it appears to be a neutral or isotropic fat, as shown by staining red with sudan III and by the absence of double refraction. The histochemical examination with other differential fat stains, including the Lorraine-Smith-Dietrich, Fischler and Ciaccio, was inconclusive. Considerable doubt has been cast, however, on the specificity of these stains for lipoids within tissue.

Both lipoids and iron are known to be end-products of metabolism which may be deposited in the tissues or in the cells of the reticuloendothelial system, and their presence accounts for the peculiar color of the cutaneous lesions. It seems a reasonable inference that the excess of lipoids in the blood in necrobiosis is not derived from outside sources, but is fat that has previously been stored or synthesized. Whether there is also an increased permeability of the capillary walls to the plasma lipoids is a question that remains to be solved. As Urbach pointed out, the conception of lipoid degeneration of connective tissue, as assumed by Oppenheim, is not held by pathologists, and it has not been demonstrated that fat ever originates from protein in the human organism.

These observations justify the classification of necrobiosis among the symptomatic or secondary forms of lipoidosis, which includes diabetic lipemia. Its characteristic clinical and histologic picture differentiates it from all other known systemic lipoidoses, such as the

cholesterol lipoidosis, which is found in xanthomatosis and Schüller-Christian's disease, the phosphatide lipoidosis of Niemann-Pick's disease and the cerebroside lipoidosis of Gaucher's disease. Urbach, in his classification of the cutaneous lipoidoses, divided them into generalized and localized types. Among the latter he included necrobiosis, resorption xanthelasmas and Kreibich's degeneration of the elastin. Our own observations incline us to look on necrobiosis as a symptomatic or local manifestation of a generalized lipoidosis.

TREATMENT

The therapeutic problem presented by patients with necrobiosis lipoidica diabeticorum is obviously one of control of the underlying metabolic disturbance, the hyperglycemia and the lipemia, in the effort to promote the involution of the cutaneous lesions. In clinical cases of diabetes mellitus, a general increase of all lipoid constituents of the blood is not infrequent. The lipemia bears no direct relationship to the glycosuria, but usually occurs in diabetic persons with acute forms of the disease and a tendency to ketosis. Owing to the occurrence of lipemia, Bloor, Allen and Joslin concluded that the diabetic organism has some defect in the mechanism for the transportation, disposal or metabolism of fat, and they emphasized the value of limitation of fat in the diet. Some clinicians even believe that lipemia is a better index of the severity of diabetes than is hyperglycemia. By the administration of insulin the hyperlipemia of severe diabetes can be reduced with rapidity, even though the insulin does not affect the cholesterol of normal blood.

The importance of the caloric intake in determining the level of the lipoids of the blood in diabetic patients with xanthoma has been emphasized by Wile, Eckstein and Curtis.[8] In one case, by decreasing the diet from 3,330 to 2,550 calories, they observed a drop in the total lipoids of the blood and involution in the xanthomatous tumors. It was not the ingested fat that led to the changed lipoid content of the blood, for the decrease of calories was brought about by elimination of the greater part of the carbohydrates from the diet. The authors concluded that the changed level of the blood lipoids in such conditions as xanthoma was insufficiently understood and that the high cholesterol content of the blood, sometimes found in xanthoma, was not the primary cause of the disease. They attempted to solve the problem by chemical analysis of the tumors and by spectroscopic and colorimetric procedure. Other observers have noted that diets low in cholesterol in combination with insulin may reduce the excess cholesterol in the blood and cause

8. Wile, U. J.; Eckstein, H. C., and Curtis, A. C.: Lipid Studies in Xanthoma, Arch. Dermat. & Syph. **19**:35 (Jan.) 1929.

the cutaneous lesions of xanthoma to disappear, but are ineffective in nondiabetic patients. Curtis, Sheldon and Eckstein,[9] in a careful study of the relationship of severe diabetes, lipemia and xanthoma, found that on a diet high in carbohydrate and calories the lipemia did not reappear when enough insulin was given to control the diabetes. The xanthomatous tumors did not reappear when the lipemia was reproduced experimentally.

The treatment of necrobiosis with insulin and various diets has been only partially successful. Urbach found that a diet poor in fat and rich in carbohydrate, with insulin, checked the further expansion of the lesions over a six week period and made the patches softer and paler. In Balbi's case, treatment with insulin in doses up to 50 units a day and an antidiabetic diet rendered the patient sugar-free in forty days and led to a cicatrization of the ulcers, but did not otherwise influence the lesions. In our two cases the therapeutic response was negligible. The regular administration of insulin, even when given subcutaneously under the lesions, as suggested by Urbach, failed to influence the lesions. A slight diminution of the color of the plaques was noticeable when a strict diet low in fat was adhered to while taking insulin. Roentgen treatment was without effect. Intensive local treatment with ultraviolet rays was apparently the only measure that caused partial involution of the lesions, with a diminution of the color and consistency. Subsequently, when dietary instructions were not fully complied with and the blood sugar rose to 425 mg., there was a return of the dark yellow, glistening color in all the lesions. In this connection it may be recalled that in cases of xanthoma which do not respond to a diabetic diet and insulin, ultraviolet light may bring about a reduction in the blood cholesterol and may increase the tolerance for sugar, suggesting that there may be a direct effect of ultraviolet rays on the cholesterol metabolism, producing a better diffusibility.

SUMMARY AND CONCLUSIONS

1. Two cases of necrobiosis lipoidica diabeticorum (Urbach-Oppenheim) are reported, with necropsy observations in one case.

2. Necrobiosis lipoidica diabeticorum is a rare disease of the lipoid and carbohydrate metabolism, characterized by yellow to buff-colored scleroderma-like plaques on the lower extremities.

3. The histologic changes are pathognomonic and consist primarily of vascularitis with perivascular lymphocytic infiltration and extensive necrobiotic areas in the corium containing swollen collagen fibers which are infiltrated by droplets of lipoids, the nature of which has not been determined.

9. Curtis, A. C.; Sheldon, J. M., and Eckstein, H. C.: Experimental Reproduction of Lipemia, Am. J. M. Sc. **186**:548, 1933.

4. The pathogenesis of the disease is explained by a deposition or imbibition in the necrobiotic intercellular connective tissue of the excess lipoids present in the blood, following changes in the cutaneous blood vessels caused by the diabetes.

5. The lesions must be differentiated from xanthoma, amyloidosis, scleroderma and similar dermatoses.

6. The disease is chronic and is resistant to treatment with insulin and to diets low in fat.

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ABSTRACT OF DISCUSSION

Dr. Udo J. Wile, Ann Arbor, Mich.: It is difficult to discuss intelligently as rare an entity as the condition dealt with by Dr. Zeisler and his co-worker, Dr. Caro. I saw one of the patients and can attest to the unique character of the lesions.

It is, of course, not a disease, but a rare manifestation of the many forms of lipoid disturbance which occasionally accompany glycosuria. The lesions look not unlike xanthomatous tumors which have undergone distinct necrosis. The yellowish color is distinctly xanthoid. The exclusive occurrence of the condition with diabetes distinguishes it from true xanthoma. The microscopic picture is distinguished definitely from that found in xanthoma by the presence of a marked inflammatory exudate, by the characteristic necrosis and by the occluded blood vessels, all in the presence of a large amount of free pigment. Nevertheless, there are certain points of similarity to true xanthomatous lesions, notably in the manner in which the extravasated lipoid is laid down.

As was shown many years ago by Dr. Pollitzer and myself, the earliest xanthomatous changes are found in the endothelium of blood vessels, where there are deposited fine droplets of fat-staining substances. This change is also noticeable in the lesions under discussion.

The cases reported are examples of an interesting, rare disorder of fat metabolism producing xanthoma-like lesions apparently as part of a definite disorder of the general lipoid metabolism, as evidenced by a deranged lipoid balance in the blood.

Dr. Fred D. Weidman, Philadelphia: It is natural when dealing with a diabetic disease in which yellow appears on the skin to think of xanthoma. Perhaps the one obstacle in the way of wholeheartedly accepting the diagnosis of xanthoma is the extreme yellowness. From a limited observation clinically, when I saw one of the patients of Dr. Zeisler and Dr. Caro in Chicago I could not come to a conclusion with regard to the pathologic process of this phase of diabetes.

However, on examining the histologic sections, I felt sure that the condition is not essentially xanthomatous, as the authors have concluded. The changes, as indicated in the name of the disease, are necrobiotic, that is, a near-necrosis, not the gangrene often seen in diabetes, but an approach to it, or necrobiosis.

There is one point on which I disagree with the authors, namely, that the process is fundamentally toxic, and that diabetic toxins are responsible for the pathologic changes. The process is not quite an infarct, because it is not completely a necrosis; it is a necrobiosis.

From the sections it did not appear that there were notable inflammatory cells around the thrombi; therefore the thrombosis might well be mechanical, or at least only obstructive rather than toxic. If that is the case, one can understand how there would be a shutting off of nutrition, just as occurs in infarction. If the occlusion were not quite complete (there still being sufficient collateral anastomoses), it would lead to a slowly developing, infarct-like process. The concept of vascular occlusion would thus serve to explain the central focus of necrobiosis. It would also explain the pigment. Infarcts may sometimes be "anemic," but hemorrhagic infarcts are deeply pigmented a deep orange-yellow resembling that seen in the kidneys and spleen. Furthermore, perhaps by a stretch of reason it might also explain the telangiectasis. There is a zone of collateral hyperemia around an infarct which might parallel the telangiectasis. In either case, the disturbances of vascularity would be a reaction against a fundamentally necrotic focus.

As to the elastic tissue changes, I think they parallel the mechanism that Kissmeyer and With described as "elastic degeneration in scars," which is classified among the large general group of the yellowing dermatoses. There is no difficulty in separating the processes here from those which are fundamentally xanthomas.

Dr. Jeffrey Michael, Houston, Tex.: I have seen one of the patients, and after listening to the discussion it occurs to me, too, that the condition has a considerable affinity with the processes in xanthoma. I was interested to hear that the lipoid constituents of the blood were altered. The investigations of Schaaf and Werner and Nicholas and myself (reported at the meeting of the American Medical Association last year) on the imbalance of circulating lipoids in xanthoma would indicate that Schaaf and Werner's hypothesis of the pathogenesis of these lesions is tenable, though not entirely acceptable in all of its aspects.

The fact that the lesions occur on the dependent parts should indicate something as to their pathogenesis, and suggests that stasis plus a lipoid imbalance has a great deal to do with it. The presence of hemosiderin might also be explained by the fact that this is a phenomenon of stasis.

Dr. Erwin P. Zeisler, Chicago: Our first patient was presented a year ago at the meeting of the American Dermatological Association, and I suspected that the members were looking at a condition they had never seen before. In other words, my colleague and I were demonstrating a dermatosis that was new to American dermatologists. If we had not had Urbach's article with pictures corresponding exactly with ours, we might have had difficulty in convincing the members that we were not dealing with a xanthomatous change in some other cutaneous lesion. The peculiar yellow color naturally suggested xanthoma.

Further observations and the discovery of a second case in a diabetic patient served to confirm our impressions that this is definitely a new dermatosis, and have corroborated the observations of Urbach and Balbi. Since then a number of additional cases have been observed by other European dermatologists, and Dr. Michelson has had two other cases under observation. Dr. Michelson feels that necrobiosis is more closely allied to gangrene than it is to xanthoma. He thinks that the histology is more nearly that of gangrene, with which we are willing to agree, though certainly there is not the slightest resemblance clinically between diabetic gangrene and the dermatosis we have reported here. In two of the reported cases ulceration occurred, but there has never been any definite gangrene.

Regarding the nature of the lipoid imbibition in the necrobiotic areas, histochemical studies have indicated that the lipoid is a neutral fat or a mixture of fats; it is definitely not cholesterol and not a cholesterol ester, because of the negative staining reactions and absence of double refraction. Furthermore, the absence of foam cells and of the general architecture of a xanthoma should rule this out. In xanthoma necrobiotic areas are not found.

In answer to Dr. Weidman, I should like to say that around some of the vessels that were not yet thrombosed there were areas of intense inflammation apparently preceding thrombosis.

The underlying condition here, we think, is vascular. There are markedly inflammatory changes around the blood vessels and thrombosis in the blood vessels. Undoubtedly the fact that in every case reported there has been severe diabetes with not simply lipemia, but hyperlipemia, is indicative of the underlying pathologic process.

When new textbooks on dermatology are written, there will have to be included this new dermatosis, and I think the title Urbach has given it will probably be retained.

HINTON TEST AND LUMBAR PUNCTURE IN TREATED PRIMARY AND SECONDARY SYPHILIS

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The spinal fluid of persons infected with syphilis so often shows a positive Wassermann reaction and other abnormalities due to the disease, even when the Wassermann reaction of the blood is negative, that most neurosyphilologists have taught that every syphilitic patient should have at least one lumbar puncture for examination of the spinal fluid. Examinations of the spinal fluid in primary and secondary syphilis have been considered helpful: (1) in detecting syphilis, (2) in forecasting tertiary neurosyphilis and (3) in determining the absence or persistence of infection when the Wassermann test of the blood has become negative as the result of treatment. This paper is chiefly concerned with the third purpose.

For detection of syphilis in the primary and secondary stages, the information to be gained from an examination of the spinal fluid is almost never necessary, because more accurate evidences of the disease are far easier to obtain.

Examinations of the spinal fluid early in the course of the disease are not especially helpful in forecasting neurosyphilis, since the mere occurrence of abnormalities of the spinal fluid in the primary or secondary stage of the disease has no significant value in predicting clinical neurosyphilis. During the primary stage abnormalities of the spinal fluid due to syphilis occur in about 30 per cent of the cases, and in the secondary stage, in about 70 per cent; nevertheless, in only from 5 to 7 per cent of all syphilitic patients do well marked clinical signs and symptoms of tertiary neurosyphilis develop. Even in the tertiary stage, with little or no treatment, the reaction of the spinal fluid, so far as I can determine, ultimately becomes negative in about half of the cases in which there have been abnormalities during the earlier stages.

On the other hand, the results of examinations of the spinal fluid have aided greatly in deciding the question of the persistence of the infection when the Wassermann reaction of the blood has become negative as the result of treatment. When, however, a sufficiently sensitive serum test for syphilis is used, a negative reaction of the

From the Department of Clinical Research, the Boston Dispensary.

blood, verified by repetition, almost totally excludes the likelihood of there being laboratory evidence of neurosyphilis obtainable by lumbar puncture.[1]

A study of 361 consecutive patients with primary and secondary syphilis admitted to the clinic for syphilitic diseases of the Boston Dispensary between July 1929 and June 1932 was made to ascertain what effect the use of the Hinton blood test [2] would have on the number of examinations of spinal fluid that are desirable as aids in determining the persistence of the infection within the first two years of the disease. In each case the diagnosis of syphilis was made on a combination of definite clinical and laboratory criteria. Seventy per cent of the cases of primary syphilis gave positive results in a dark-field examination, and all cases of secondary syphilis showed a positive reaction of the blood with a rash or other unmistakable signs of the secondary stage.

TABLE 1.—*Primary Syphilis: Serologic and Neurologic Data in Fifty-Five Cases of Treated Primary Syphilis*

		Wassermann				Kahn				Spinal Fluid				Neurologic Signs			
Hinton		+	±	−	0*	+	±	−	0*	+	±	−	0*	+	±	−	0*
Positive (+)	11	3	1	6	1	8	0	3	0	1	0	0	10	1	1	5	4
Doubtful (±)	3	..	..	3	..	..	..	3	..	..	..	..	3	..	1	1	1
Negative (−)	41	..	..	41	..	..	..	41	..	..	..	7	34	..	1	22	18
	55	3	1	50	1	8	0	47	0	1	0	7	47	1	3	28	23

* 0 signifies that the test was not done.

One hundred and fifty-three of the 361 patients were under observation and treatment for more than twelve months and had blood tests between the twelfth and eighteenth months. It is to these 153 patients that I shall devote the major portion of this paper. Of the remaining 208 patients, 16 in the primary stage never had a positive reaction of the blood or later clinical signs of the disease; 182 patients were under observation or treatment for less than a year, and 10 of those observed and treated for more than twelve months had no blood tests between the twelfth and eighteenth months.

Of the 153 cases that were observed for twelve months or longer, the 55 cases of primary syphilis are tabulated in table 1, according to the results of the latest Hinton, Kahn and Wassermann tests, which were made between the twelfth and eighteenth months of their observation and treatment; the 98 cases of secondary syphilis are similarly tabulated in table 2.

1. Berk, Arthur, and Hinton, W. A.: The Value of a Negative Hinton Test in the Exclusion of Neurosyphilis, Am. J. Syph. & Neurol. **18**:92 (Jan.) 1934.

2. Hinton, W. A.: Hinton Test for Syphilis; Third Modification, J. Lab. & Clin. Med. **18**:198 (Nov.) 1932.

PRIMARY SYPHILIS

That during the period of treatment the reaction to the Hinton test remains positive longer than that to a less sensitive test is indicated in table 1. Of the 11 cases which showed a positive reaction to the Hinton test after twelve or more months of treatment, 8 showed a positive Kahn reaction and only 3 a positive Wassermann reaction.[3]

In the 11 cases showing a positive reaction to the Hinton test the 1 spinal fluid that was examined (case 302310) was positive.[4] This case is listed in the table as presenting neurologic signs also. The Wassermann reaction of the blood was negative at the time of the lumbar puncture (one month after treatment was begun), and the Wassermann and Kahn reactions continued to be negative up to the conclusion of this study. This case illustrates the coincidental occurrence of negative reactions to the Wassermann and Kahn tests and a positive spinal fluid, thus demonstrating that unless sensitive blood tests are used, examination of the spinal fluid is desirable as an aid in determining the persistence of the infection.

TABLE 2.—*Secondary Syphilis: Serologic and Neurologic Data in Ninety-Eight Cases of Treated Secondary Syphilis*

		Wassermann				Kahn				Spinal Fluid				Neurologic Signs			
Hinton		+	±	—	0*	+	±	—	0*	+	±	—	0*	+	±	—	0*
Positive (+)	48	17	0	29	2	23	2	23	0	0	1	6	41	1	2	22	23
Doubtful (±)	6	1	..	5	..	..	..	6	..	..	..	..	6	..	..	2	4
Negative (—)	44	1	..	40	3	..	..	44	..	..	2	9	33	1	..	24	19
	98	19	0	74	5	23	2	73	0	0	3	15	80	2	2	48	46

* 0 signifies that the test was not done.

Thirty-four of the 55 patients were observed, and some of them treated, for more than eighteen months. During the period of obser-

3. Sanford, A. H.: Which Test for Syphilis? Am. J. Clin. Path. **1**:347 (July) 1931.

4. In the tables and throughout the text, the spinal fluids are designated as positive, doubtful and negative, in accordance with the following findings: (1) Positive, when there is a positive Wassermann reaction (1 cc. or smaller quantities giving a positive reaction) and one or more of the following: a cell count of 10 or more, more than a slight increase (from 2 to 4) in globulin, a colloidal gold curve of 3 or more in zone 1 or 2 and a total protein of more than 60 mg. for each 100 cc. of spinal fluid. (2) Doubtful, when there is one or more of the following: a doubtful Wassermann reaction (2 cc. being positive, but 1 cc. and smaller quantities negative), a cell count of 6 or more, a slight increase in globulin, a colloidal gold curve up to 3, 4 or 5 in zone 1 or zone 2 and a total protein of more than 60 mg. (3) Negative, when all of the following are found: a negative Wassermann reaction in all of the quantities (from 0.1 to 2 cc.), a cell count of 5 or less, the slightest trace of globulin (1+ to 0), a colloidal gold curve showing no reactions in zones 1 and 2 and total protein 60 mg. or less.

vation and treatment the Hinton reaction remained positive in 5 cases and negative in 27; in 1 case there was a definite serologic relapse and in another a suggestion of a serologic relapse. In 1 case (305749), following twelve months of treatment, the patient gave a negative reaction to the blood tests for a period of nine months; at the end of this time results of the Hinton test were doubtful, and three months later, positive. During all of this time the patient was under continuous treatment and had no clinical signs which indicated the serologic relapse. In 1 case (305289) in which the reaction to the Hinton test changed from negative to doubtful treatment ceased seventeen months after the first admission. At the time of the last treatment, examination of the spinal fluid gave negative results. Eight months after the lumbar puncture the reaction of the blood was doubtful. The patient did not return for further observation, and consequently it is not known whether there has been a true serologic relapse.

Though there were no cases in which there was a definite clinical relapse, 2 cases (291012 and 307910) showed signs suggestive of a relapse. Both patients gave positive reactions to the Wassermann, Kahn and Hinton tests, and the reactions remained positive throughout the period of observation, which was thirty-five months in one case (291012) and twenty-three months in the other (307910). In case 291012 the neurologic examination gave negative results; in case 307910 a neurologic examination was not made.

SECONDARY SYPHILIS

Among the 98 cases of secondary syphilis in table 2, there were 48 showing positive reactions to the Hinton test, 23 positive reactions to the Kahn test and 19 positive reactions to the Wassermann test. In the 18 cases in which the spinal fluid was examined it was positive in none and doubtful in only 3. The 2 cases in which the Wassermann test appeared to be more sensitive than the Hinton or Kahn test were cases 307198 and 311148.

In case 307198, in which the Wassermann reaction was positive and the Hinton doubtful, the Wassermann, Hinton and Kahn reactions were negative six months later, though the Hinton and Kahn reactions became positive after an additional six weeks of treatment.

In case 311148, the Wassermann reaction was positive, and the reactions to the Hinton and Kahn tests were negative; there were no subsequent blood tests. Nine months previously blood tests by all three methods gave negative results. The significance of the isolated positive Wassermann reaction is difficult to determine because of the infrequence with which examinations of the blood were made in this particular case.

In passing, it may be said that as an aid in gaging treatment examination of the blood should be made at least every two months.

In 2 cases (306491 and 302783) in which the reaction to the Hinton test was negative the spinal fluid was doubtful. Eighteen months after admission and during treatment the spinal fluid in case 306491 gave an atypical colloidal gold curve (4322332100). The reactions of the blood had been negative for one year. Four months after the lumbar puncture, the Hinton reaction of the blood was positive, and at two subsequent examinations, made at intervals of six and ten weeks, respectively, the Hinton reaction was positive. The Wassermann reaction was positive once, and the Kahn reaction was negative on the first examination and positive on the two subsequent examinations. Neurologic examination gave entirely negative results during the twenty-three months of treatment and observation.

In case 302783, the spinal fluid was negative except for an atypical colloidal gold curve (5400000000) seven months after admission. The Hinton reaction was negative two weeks previous to the lumbar puncture and positive five weeks and seven weeks after the lumbar puncture, but it became negative after six months of treatment. Neurologic examinations at all times gave negative results.

In the one case (304945) shown in table 2 in which the reaction to the Hinton test was positive and the spinal fluid doubtful (except for an atypical colloidal gold curve of 5231100000 the results were negative) there was no clinical evidence of neurosyphilis. The lumbar puncture was done seven months after the first admission, at which time all of the tests of the blood gave negative results. The Hinton and Kahn reactions eleven months later were positive, as shown in table 2, and they continued to be positive throughout the remainder of the study (ten months).

In one patient (case 309827) shown in table 2 to have neurologic signs and a negative reaction to the Hinton test a diagnosis of meningovascular syphilis was made ten months after the first admission. At that time the Hinton test of the blood was positive, but five months later it was negative and remained so. Two years after admission, the spinal fluid was negative. In spite of a serologic cure, this patient did not improve clinically to the extent expected.

Observation and treatment were carried out over a period of more than eighteen months in 63 of the 98 cases of secondary syphilis. The reaction to the Hinton test in 18 of the 63 cases remained positive and in 22 negative; in 15 it changed from positive to negative, and in 8 cases there was a serologic relapse of from nine to twenty-one months after the Hinton reaction first became negative. The following is a somewhat detailed account of these 8 cases:

In 2 cases (301499 and 306491), five months before the serologic relapse, the spinal fluid was negative in one and doubtful (atypical colloidal gold curve, 4322332100) in the other. In the third case (305618), the spinal fluid was negative eleven months before the serologic relapse. In the fourth case (300500), the reactions to the Hinton test were irregularly positive and negative over a period of two and a half years; examination of the spinal fluid at the end of the first six months of treatment gave negative results and was preceded and followed by a positive reaction to the Hinton test. In the fifth case (294012) the relapse was indicated by a positive reaction to the Hinton test ten months after the last positive reaction, and the spinal fluid and Hinton reaction of the blood were negative seven months after this. In the 3 remaining cases (304714, 307198 and 197351) lumbar puncture was not done; there were, however, no neurologic signs in the 1 case in which a neurologic examination was made. The blood tests in case 304714 gave negative results nine months after the first admission and continued to do so for fifteen months, when the reaction to the Hinton test became positive, though the Wassermann and Kahn tests remained negative. This serologic relapse occurred during the sixth month of pregnancy, and antedated by five months the clinical relapse, which began two months after the birth of the child. At the time of the reappearance of clinical signs (cutaneous lesions), blood tests gave positive results by the three methods.

In 4 cases (301499, 309827, 307219 and 295281) there were clinical relapses, the details of which are as follows:

I have discussed cases 301499 and 309827. The reaction to the Hinton test in case 307219 remained positive, in spite of intensive treatment. In case 295281 the reaction became negative after fourteen months of irregular treatment. Three months later the spinal fluid was of doubtful results (atypical colloidal gold curve, 4222310000), and six weeks after lumbar puncture, while the reaction of the blood was still negative, there were "vesiculopapular circinate" lesions on the hands and wrists. If these lesions were syphilitic, it is the first instance in my experience in which there were, at the same time, active cutaneous lesions, negative reactions of the blood by all three methods and an essentially negative spinal fluid. After one month of additional observation and treatment examination of the blood still gave negative results.

CASES IN WHICH LUMBAR PUNCTURE WAS DONE

Table 3 shows the results of examination of the spinal fluid in relation to the Hinton test and neurologic examinations in 50 of the 361 cases in which lumbar punctures were performed. Twenty-six of the cases have been included in tables 1 and 2. Case 321656 in which, as shown in table 3, the spinal fluid was positive but no Hinton test was done, does not appear in tables 1 or 2, as the patient had been under observation less than a year at the close of the study. In this case there were 3 negative reactions of the blood to the Hinton test, then a doubtful reaction and five months later a positive spinal fluid, two months after which the reaction of the blood was positive. This case of asymptomatic neurosyphilis illustrates the desirability of taking blood for examination whenever a lumbar puncture is being done.

Of the 5 patients who had doubtful spinal fluids, 2 gave positive reactions to the Hinton test of the blood, 2 (previously noted as having no abnormalities except an atypical colloidal gold curve) gave negative reactions to the Hinton test of the blood, and 1 had no test done within a month of the time of lumbar puncture.

Forty-four of the patients had negative spinal fluids.

In none of the 50 cases did an examination of the spinal fluid aid in determining the persistence of syphilis, nor was it required in any of them for the purpose of differential diagnosis. Time alone can decide the prognostic value of these 50 examinations of the spinal fluid, for

TABLE 3.—*Clinical and Serologic Data in the Fifty Cases of Treated Primary and Secondary Syphilis with Lumbar Puncture*

	Clinically Negative			Clinically Doubtful			Clinically Positive		
Spinal Fluid	+	±	−	+	±	−	+	±	−
Hinton (+)	..	2	10	..	..	4	1	..	..
Hinton (±)	..	..	3	..	..	..	..	..	..
Hinton (−)	..	2	18	..	..	2	..	..	..
Hinton (0*)	1	1	5	..	..	1	..	..	..
Totals	1	5	36	..	..	7	1	..	..

* 0 signifies that no Hinton test was done within a month of the lumbar puncture.

TABLE 4.—*Neurologic Examinations and Results of Hinton Tests in One Hundred and Eighteen Cases of Treated Primary and Secondary Syphilis*

	Hinton Tests at Time of Neurologic Examinations		
Neurosyphilis, Clinical Examination	Positive	Doubtful	Negative
Absent	40	7	56
Doubtful	8	2	3
Definite	2	0	0
Totals	50	9	59

some of the patients with negative reactions may suffer relapses, and some with doubtful reactions may recover or get worse. The 2 cases showing a positive spinal fluid are even more puzzling, though in the case in which there was asymptomatic neurosyphilis the patient could be told that his prognosis was probably more serious because of the positive spinal fluid.

CASES IN WHICH A NEUROLOGIC EXAMINATION WAS MADE

Table 4 shows a comparison of the Hinton test and the neurologic examination (done within one month of each other) in 118 of the 361 cases. This table includes all of the patients who were shown in tables 1, 2 and 3 as having had a neurologic examination. The Hinton reaction was negative in no patient in whom there were definite clinical

signs of neurosyphilis. Of 3 patients in whom there were questionable signs, 1 (case 301701) had a negative spinal fluid twenty-five months after the first admission; 1 (case 305749) with continued negative Wassermann and Kahn tests gave a doubtful reaction to the Hinton test and then a positive reaction, twenty and twenty-three months, respectively, after the first admission; 1 patient (case 306799) showed nothing clinically except that the left fundus was obscured, and irregular attendance thwarted further laboratory tests and neurologic examinations. The possibility of a positive spinal fluid at the time of a negative reaction to the Hinton test in any case would be slight.

SUMMARY AND CONCLUSION

The observations which form the basis of this paper have merely pointed out that with the aid of an unusually sensitive blood test for syphilis, lumbar punctures are not necessary during the first two years of the disease for the purpose of determining the persistence of the infection. That the infection may persist, in spite of even a negative reaction to the Hinton test, has been indicated by serologic relapses in 12 cases. In none of 6 of these cases in which lumbar puncture was done did the examination of the spinal fluid help more than the Hinton test in determining this persistence.

COMMON WARTS

AN EFFECTIVE TREATMENT

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Twelve months ago, a patient was given a maximum of roentgen and radium therapy for warts which involved the finger-tips of both hands, without effect. They ramified down under the nail plates and involved the greater part of the cuticular borders. It is well known that therapy by local irritation is markedly enhanced by previous short wave therapy. It was for the latter reason that this procedure was first instituted, and I have now adopted it to the exclusion of all other methods. It has yet to fail in a single instance.

Using a fine spark, the verrucous surfaces were lightly seared. The patient returned at weekly intervals, and the procedure was repeated. To my surprise involution and desquamation of the lesions occurred within six weeks. At this time I attributed the reaction to: (1) a result of the combined action of the treatment with rays of short wavelength and the superficial electrodesiccation or (2) spontaneous healing. The continued use of the procedure for twelve months, however, has demonstrated conclusively that it is the method of choice. It provides the solution to what can be a vexing problem.

The degree of pain experienced during treatment, except in rare instances, is negligible and easily tolerated. In only one case has it been necessary for me to use procaine hydrochloride. The lesion in question proved itself resistant to roentgen rays in doses as high as 3, 2 and 2 skin units, given over a three month interval. The lesion subsided following each exposure only to gain renewed growth a few weeks later. It was a single large wart, situated on the lateral aspect of the soft tissues of the thumb about ¼ inch (0.64 cm.) below the level of the base of the nail. It was painful and evidently exquisitely tender. A 2 per cent solution of procaine hydrochloride was applied to the pared surface of the wart by means of a soaked pledget for fifteen minutes. Here again the desiccation was essentially superficial. After the first two visits the procaine was unnecessary.

The method is immeasurably superior to surgical removal or electrodesiccation proper, as these procedures include the necessity for local anesthesia, followed by dressings, coupled with a possibility of keloid formation and temporary incapacitation of the patient. Using

the present procedure the patient can follow his daily routine; for example, the method was recently used on the hands of a proctologist, who was scrubbing up and performing operations daily while under treatment.

The method, which may be termed superficial fractional desiccation, is simple and is carried out as follows: Cleanse the surface of the wart. Using a moderate spark, commencing inside the margin of the corneus collaret, circle the border, then sear and carbonize only the surface proper of the wart. Repeat the procedure at biweekly intervals.

The only difficulty I have experienced has been in attempting to estimate from clinical signs when to stop the treatment, and in some instances I feel that I have continued beyond the stage of necessity; however, it must be admitted that it is difficult to determine definitely whether there still remains any activity after the third or fourth treatment. Thus far there have been no recurrences following the five or six treatments, which is the number ordinarily given.

The reason for the apparent susceptibility of warts to this superficial trauma is difficult to determine, for the roots of the papilloma, or the base of the several papillae, are lodged fairly deeply in the tissues in comparison with the depth of tissue destroyed in this superficial intermittent procedure. Response to this form of therapy is difficult to understand, as it is well known that warts have a marked resistance to other forms of rather powerful treatment. Is it possible that the degree of shock is of less moment than the occlusion of air which would ensue from the charring of the surface? Are these low grade forms of life strictly aerobic?

Only one patient with plantar warts has been subjected to this form of therapy, with the usual good result.

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LYMPHOGRANULOMA INGUINALE

I. PRESERVATION OF FREI ANTIGEN BY DRYING; ITS CONCENTRATION IN FRESH AND IN DRIED PUS

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The value of the Frei test in the diagnosis of lymphogranuloma inguinale is now generally recognized. Little is known, however, about the substance that is responsible for the reaction. The work reported here has been undertaken in order to ascertain the extent to which the properties of the original fresh pus derived from uncontaminated inguinal buboes are preserved or modified by drying in vacuo from the frozen state. The ability to withstand drying of the agent responsible for the production of a positive Frei reaction has not, to our knowledge, been investigated.

This article deals with the comparison of the cutaneous reactions produced in normal subjects and in patients with recent and old cases of lymphogranuloma inguinale by the use of Frei antigens of various strengths prepared from fresh and dried pus. The titer of such antigens was established at the same time in the same persons.

There was no selection of cases of lymphogranuloma inguinale used in this study other than to employ approximately equal numbers of persons with the anorectal and inguinal varieties of the disease.

MATERIAL AND METHODS

The Collection of Lymphogranulomatous Pus.—Material was obtained from three patients with the inguinal type of lymphogranuloma inguinale, the short histories of whom follow.

CASE 1.—X. V. C., a white man, aged 73, was admitted to the hospital on Oct. 3, 1933, with a tender mass on the left groin of eleven days' duration. The condition began with a sudden, sharp pain in the left groin which was followed in a few hours by the appearance of a small tender mass which gradually increased in size up to the time of admission. Sexual exposure was said to have been frequent, and it was impossible to fix the date of a particular coitus preceding the development of the condition.

On examination the inguinal mass measured 9 by 4 cm., and consisted of matted glands, with considerable firm periglandular tissue.

The reaction to a Frei test, performed on October 6, was positive. The Wassermann reaction was positive, and roentgen and physical examinations indicated the presence of a large aortic aneurysm. A penile lesion was present thirty-six years previously, but no antisyphilitic treatment was received. There was no history of gonorrheal or chancroidal infection.

The affected glands were excised on October 4, and were found to contain thick purulent material which was bacteriologically sterile. The wound was

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stitched up at once, and healed completely. On November 10, while receiving antimony and potassium tartrate, a tender, fluctuant, enlarged gland appeared in the left Scarpa triangle. This was aspirated, yielding 2 cc. of inodorous, thick pus, which was labeled material 113. The pus gave no growth in dextrose phosphate broth and in liver dextrose broth on aerobic and anaerobic culture. Frei antigen 113 was made from a portion of this pus, the remainder being dried in vacuo from the frozen state.

Microscopic examination of the glands excised on October 4 showed a subacute granuloma with multiple miliary abscesses.

Case 2.—F. P., a Negro, aged 35, was admitted to the outpatient department on Nov. 25, 1933, complaining of a gradually increasing swelling in the left groin of three weeks' duration. Sexual exposure had been frequent, and there was no history of a penile lesion or of urethral discharge.

On examination, there was a hot, tender, glazed, fluctuant swelling the size of a hen's egg lying just above the left Poupart ligament. This appeared to consist of a matting of glands and periglandular tissue. Just below the ligament was a smaller, tender, nonfluctuant mass composed of discrete glands, each about the size of a lima bean.

The glandular mass above Poupart's ligament was aspirated at once, and yielded 5 cc. of thick pus which was labeled material 118. The pus gave no growth in dextrose phosphate broth and in liver dextrose broth on aerobic and anaerobic culture. Frei antigen 118 was made from a portion of the pus, the remainder being dried in vacuo from the frozen state. The reaction to a Frei test, performed on November 25, was positive, and that to an Ito-Reenstierna test, a killed culture of Bacillus ducreyi being used, was negative. A Wassermann test was not performed.

Pus reaccumulated in the previously aspirated glands, and 6 cc. was withdrawn on November 27. The material was labeled material 117, and was treated in the same manner as material 118. The patient did not return after the second aspiration, and could not be followed up.

Case 3.—E. C., a white man, aged 30, was admitted to the hospital on Nov. 27, 1933, on account of a left inguinal swelling of two weeks' duration. This followed sexual exposure four weeks prior to the development of the adenitis. The swelling measured 12 by 5 cm., was fluctuant and slightly tender, and appeared to consist of a number of matted glands with considerable firm periglandular tissue; the overlying skin was dusky red. There was no history or evidence of a penile lesion, and the Wassermann reaction was negative. Twelve months previously the patient had gonorrhea, which subsided without treatment.

Aspiration of the glandular swelling on November 29 yielded 5 cc. of thick pus which was labeled material 119. The pus gave no growth in dextrose phosphate broth or in liver dextrose broth on aerobic or anaerobic culture. Frei antigen was made from a portion of the pus, the remainder being dried in vacuo from the frozen state.

The affected glands and periglandular tissue were excised on December 1, and an uneventful recovery was made. The reaction to a Frei test, performed on November 29, was positive, and that to an Ito-Reenstierna test using a killed culture of B. ducreyi, was negative. Microscopic examination of the excised glands revealed a picture identical with that of the glands associated with material 113.

None of the patients had received treatment for lymphogranuloma inguinale before the aspiration of pus from the inguinal glands.

Preparation of Ordinary Frei Antigen from Fresh Pus.—The pus, immediately on collection, was divided into two parts; one (approximately two fifths of the pus obtained) was used to prepare Frei antigen in the usual way.

The technic[1] consisted of the dilution of the pus with four times its volume of sterile buffered physiologic solution of sodium chloride of p_H 7.1, followed immediately by heating the mixture, sealed in a glass tube and submerged beneath water, for two hours at 60 C. on the first day and for one hour at the same temperature on the second day. After tests for sterility the antigen was sealed in quantities of approximately 1.5 cc., without the addition of a preservative.

The emulsion produced in this manner is referred to in this paper as "the ordinary Frei antigen."

Drying Pus in Vacuo from the Frozen State.—The remaining three fifths of the pus aspirated from the inguinal buboes was at once dried from the frozen state. This was carried out in a desiccator capable of exhaustion to a high degree of evacuation and fitted internally with two receptacles, one containing solid carbon dioxide and communicating with the external air and the other containing phosphorus pentoxide. Material to be dried was allowed to remain in an open Petri dish, resting on the receptacle chilled by the solid carbon dioxide, under combined influence of low pressure, low temperature and dehydration for at least twenty-four hours, after which it was sealed in glass tubes.

Both the dried material and the ordinary Frei antigens were kept in the refrigerator.

Preparation of Diluted Frei Antigen from Fresh Pus.—The ordinary Frei antigen was used as a basis from which the dilutions of fresh pus were made with sterile buffered physiologic solution of sodium chloride of p_H 7.1 in proportions of 1:75, 1:750, 1:7,500 and 1:75,000. The dilutions were not heated, as the virus had previously been destroyed in the preparation of the ordinary Frei antigen. Sterility tests were made of the dilutions before use.

Preparation of Frei Antigen from Dried Pus.—Dried pus forms a creamy white, light powder, the weight of which is approximately one fifteenth of that of the fresh pus from which it has been obtained. By the addition of sterile physiologic solution of sodium chloride, dilutions of dried pus were made, ranging from 1:50 to 1:5,000,000. The former dilution was heated at 60 C. for two hours on one day and for one hour on the next day, as in the preparation of the ordinary Frei antigen. The remaining dilutions were derived from the concentrated material by the addition of sterile buffered physiologic solution of sodium chloride of p_H 7.1. Dilutions were employed in proportions of 1:50, 1:100, 1:500, 1:1,000, 1:5,000, 1:10,000, 1:50,000, 1:100,000, 1:500,000, 1:1,000,000 and 1:5,000,000.

Subjects Used for the Titration of Frei Antigens.—Eight normal subjects and eleven patients with lymphogranuloma inguinale were used in the study. Of the latter, six had the inguinal and five the anorectal variety of the disease. All the patients with the anorectal type presented active lesions and were under treatment with an antimonial preparation, and all those with the inguinal variety, except one, had obtained the infection during the previous twelve months. The exceptional case was discovered by healed, bilateral, inguinal scars, dating from 1917, when the patient had purulent adenitis unassociated with an obvious penile lesion or urethral discharge. Wassermann tests were performed on all the normal and lymphogranulomatous subjects, with the result that five normal subjects and two with the inguinal and four with the anorectal type of disease gave positive reactions and a history of treatment for syphilis.

All the subjects, normal and lymphogranulomatous, used for the titration of Frei antigens in this work were white, and only one had lived in the tropics.

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1. Frei, W.: Eine neue Hautreaktion bei Lymphogranuloma inguinale, Klin. Wchnschr. **4**:2148 (Nov. 5) 1925.

The Frei Reaction.—The Frei reaction is produced by the intradermal inoculation of 0.1 cc. of ordinary Frei antigen. This is often followed immediately by the appearance of a wheal with pseudopodia and a surrounding flare. At the end of twenty-four hours the wheal and pseudopodia have been replaced by an erythematous papule approximately 4 mm. in diameter. The flare persists. The further progress of the reaction is now governed by the condition of the person inoculated. Thus, if he has, or at any time has had, lymphogranuloma inguinale, the papule will increase in size to a maximum diameter of from 7 to 15 mm. at the end of seventy-two hours and then slowly regress to form a pigmented area in about three weeks. The latter area may persist for six months. If, however, the person never has had lymphogranuloma inguinale, the papule and flare will begin to recede after the end of twenty-four hours, disappearing without pigmentation in less than a week. Such papules in normal persons do not exceed 2 mm. in diameter at the usual time for reading Frei reactions, viz., seventy-two hours after inoculation, and are but rarely erythematous.

Antigens of high titer may produce papules with vesicular or pustular centers in lymphogranulomatous persons, and it is the rule for receding papules in such persons to show a scaly surface. There is no unpleasant local, or any constitutional, reaction from the performance of the Frei test.

Control reactions are obtained with the antigen on normal and lymphogranulomatous persons, and no antigen is suitable for use unless the reaction produced in the former case is inappreciable and in the latter, strongly positive.

The Frei reaction is highly specific, and positive results are obtained only in connection with lymphogranuloma inguinale of either inguinal or anorectal type.

For comparative purposes it is convenient to express the degree of response to the intradermal inoculation of Frei antigen by a series of plus signs ranging from 1 to 4 plus: ++++ represents a papule 7 mm. in diameter and more; +++ a papule from 5.5 to 6.9 mm. in diameter; ++ a papule from 3.5 to 5.4 mm. in diameter, and + a papule from 2 to 3.4 mm. in diameter.

Titration of Frei Antigen in Lymphogranulomatous Persons.—The titration of Frei antigen was carried out by the intradermal inoculation of 0.1 cc. of the diluted pus. In the case of antigens prepared from dried pus, the number of persons tested with each material varied with the material used. Thus, material 113 was inoculated into one person with the anorectal and one with the inguinal variety, material 118 into one with the anorectal and one with the inguinal type, material 117 into one with the anorectal and two with the inguinal variety and material 119 into two with the anorectal and two with the inguinal variety. Each person was inoculated with one material only. Certain of the test subjects had previously yielded the pus of these four materials, but no one received a homologous material in these tests. Two normal persons were employed as controls for each material. Inoculations were made with a 27-gage needle and a B-D syringe of 0.25 cc. capacity. The small syringes have a high order of accuracy in their calibration, and owing to their open divisions are well suited for administration of small measured volumes of liquid.

Reactions were read at the end of seventy-two hours and at varying intervals thereafter up to ten days. As considerable uniformity of response was found among the subjects tested with the same material, it was felt that little error would be introduced by averaging the degrees of reaction obtained in the different persons tested with the same dilutions of the same antigen. Chart 1 shows the titration of antigens prepared from dried material.

In the case of antigens prepared from fresh pus, one lymphogranulomatous person only was tested with each material. Of the four thus tested, two had the

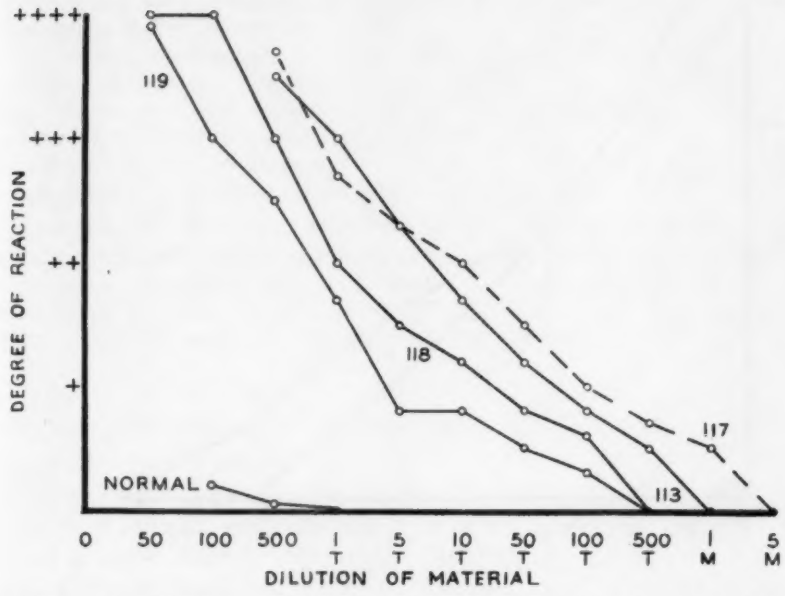

Chart 1.—Titration of Frei antigens prepared from dried material. In this and the following charts, *T* represents thousand, and *M*, million.

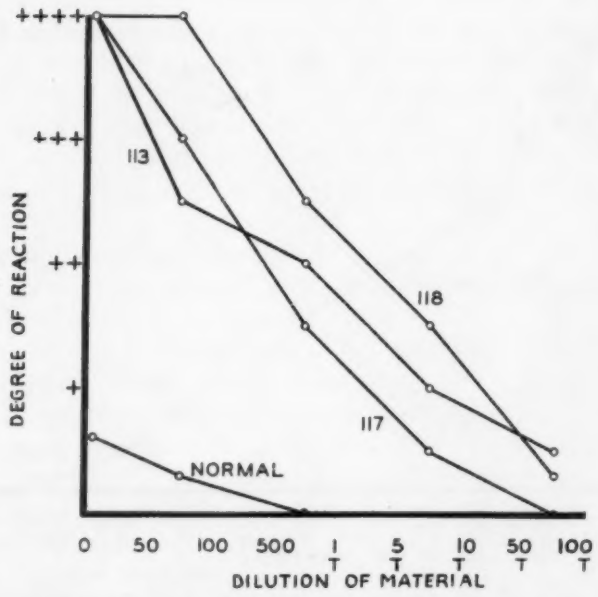

Chart 2.—Titration of Frei antigens prepared from fresh material. Material 119 is omitted, as it closely parallels material 113.

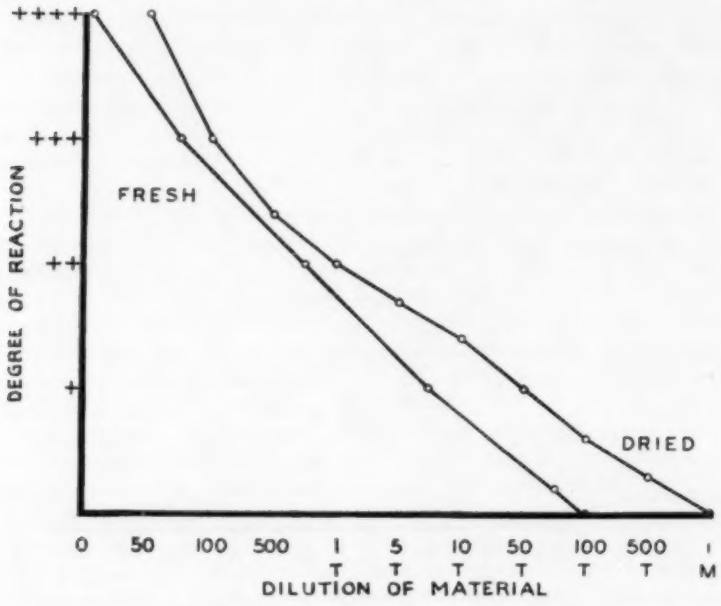

Chart 3.—Titration of Frei antigens prepared from fresh and dried material, respectively, showing the average results of antigens used.

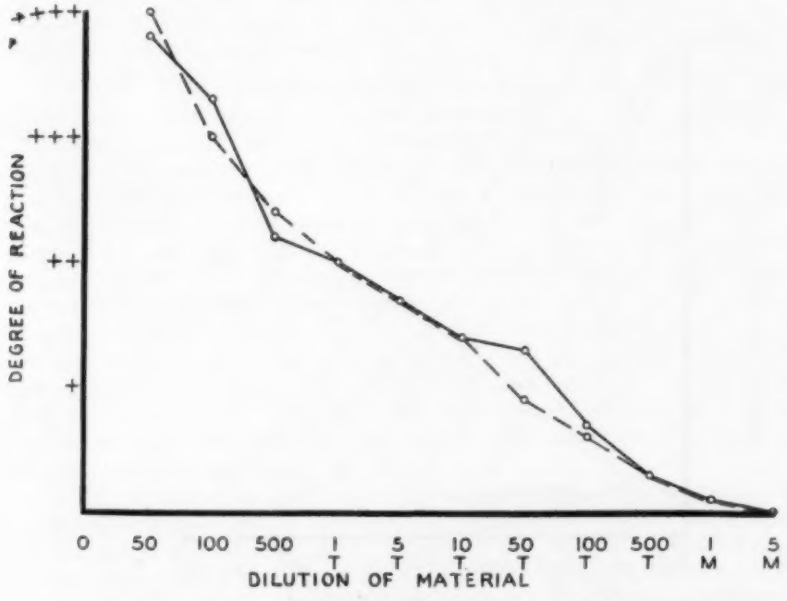

Chart 4.—Titration of Frei antigens prepared from dried materials in anorectal and inguinal types of lyphogranuloma inguinale, respectively. The broken line is for the anorectal variety and the solid line for the inguinal.

anorectal type and two the inguinal type of the disease. Chart 2 shows the titration of antigen prepared from fresh material.

In chart 3 is compared the degree of reaction obtained from fresh and dried materials, respectively. The figures are an average of the results obtained with each dilution of all four antigens used, prepared from either fresh or dried material, in all the lymphogranulomatous persons tested.

Titration of Frei Antigens in Normal Persons.—The results are set forth in charts 1 and 2 for the dried and fresh materials, respectively.

Comparison of Reactions.—The object of the comparison of reactions obtained with inguinal and anorectal types of infections, respectively, was to determine if there was a difference in the type or degree of reaction produced with the same dilutions of the same antigens in the two different clinical manifestations of lymphogranuloma inguinale. The result of the work appears in chart 4.

COMMENT

Pus from lymphogranulomatous buboes can be dried in vacuo from the frozen state without loss of the property present in the fresh pus of producing a Frei reaction in lymphogranulomatous persons. The dilution at which the upper limit of an appreciable Frei reaction is produced is regarded as the titer of the material used. Reactions produced with a dilution equal to the titer of the material are regarded as 1 plus, and are represented by a papule, the diameter of which ranges between 2 and 3.4 mm. at the end of seventy-two hours. This size of papule has been chosen to represent the 1 plus reaction, as it has been found in this work that a papule as large as this is not present in normal persons as long as three days after the performance of the Frei test with the highest concentrations of antigen used in the work. The lasting quality of 1 plus reactions is equal to that of the higher degrees of reaction, in that the weak reaction is often present with little diminution in the size of the papule ten days after intradermal inoculation. Appreciable Frei reactions are produced with the dried material in dilutions as high as from 1:4,000 to 1:100,000, with an average of 1:50,000.

The titer is somewhat lower in antigens prepared from fresh material than in those prepared from dried material, and ranges from 1:3,000 to 1:20,000, with an average figure of 1:7,500. This difference in titer may be due to the removal of a high relative proportion of inert material by the drying of the fresh material, to an inferior keeping quality of antigens prepared from the fresh material, or to a combination of these factors. The first supposition is well illustrated in the case of materials 117 and 118, which differed from each other markedly in their consistency, the latter being a thick and viscous pus and the former a comparatively watery material. The second supposition receives support from the work of Hellerström,[2] who found that one

2. Hellerström, Sven: A Contribution to the Knowledge of Lymphogranuloma Inguinale, Acta dermat.-venereol., supp. 1, 1929, p. 5.

of his Frei antigens, prepared in the usual manner from fresh pus, lost all its potency in four months.

The present work is being continued, to determine the keeping qualities of dried materials.

Additional confirmation of the identity of the anorectal and inguinal types of lymphogranuloma inguinale is afforded by the comparison of the Frei reactions obtained with the same antigens in the two different clinical manifestations. Chart 4 shows that there is almost an absolute agreement between the degrees of reaction obtained in each type of the disease with all dilutions of Frei antigen prepared from dried pus. This concordance is also shown by the use of antigens prepared from fresh pus.

It is clear, then, that dried lymphogranulomatous pus can be employed for the performance of the Frei test without loss of sensitivity or specificity. This is a valuable property of the material, as it is likely that sealed, unopened ampules of pus dried in vacuo from the frozen state can be kept for years in the refrigerator without loss of potency. This would suggest the division of freshly collected lymphogranulomatous pus into two unequal portions, one, the smaller, being made into Frei antigen at once for the testing of potency and the other being dried at once in vacuo from the frozen state. Chemical studies are planned having in view the extraction of the agent responsible for the production of the Frei test.

SUMMARY

1. Pus from three inguinal cases of lymphogranuloma inguinale has been dried in vacuo from the frozen state.

2. The titration of Frei antigens prepared from fresh and dried pus, respectively, has been carried out in eight normal and eleven lymphogranulomatous persons. The results obtained show a slight difference in titer in favor of the dried material. A possible explanation is offered for this difference.

3. Five persons suffering from the anorectal type and six suffering from the inguinal type of lymphogranuloma inguinale have been compared in their reactions to various dilutions of Frei antigens prepared from fresh and dried pus, respectively. There was agreement between the reactions obtained in the two types of the disease.

CONCLUSION

Pus from cases of lymphogranuloma inguinale can be dried in vacuo from the frozen state without change in the property of producing the Frei reaction.

ESTHIOMENE, A LATE MANIFESTATION OF LYMPHOPATHIA VENEREA

(LYMPHOGRANULOMATOSIS INGUINALIS)

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Although subacute inguinal adenitis has been on record for centuries and has been described under various names, it was not until 1913 and again in 1922 that Durand, Nicholas and Favre,[1] in their classic descriptions, pointed out the individuality of the condition and indicated its probable venereal origin. They termed the disease "lymphogranulomatose inguinale subaiguë." The interest aroused in the investigation of this disease is manifest by the voluminous literature which has accumulated, especially since 1925, when Frei [2] announced his discovery of a specific intracutaneous test, which aided greatly in establishing the identity of the disease and in determining its presence in atypical sites and forms, particularly in women. Previous to this, it had been accepted as a rarity in women.

In 1932, Wolf and Sulzberger [3] suggested the use of the name "lymphopathia venerea" to replace the original and more popular name, "lymphogranulomatosis inguinalis," because the older name bore a confusing resemblance to that of other diseases and did not embrace the various extra-inguinal localizations now recognized as being of identical etiology.

During the past decade, especially since 1930, this disease has received sufficient attention in the world literature to obviate the necessity of reviewing its interesting history and diverse nomenclature. These phases are adequately discussed by Hellerström,[4] De Wolf and

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1. Durand, M.; Nicholas, J., and Favre, M.: Lymphogranulomatose inguinale subaiguë d'origine génitale probable, peut-être vénérienne, Bull. et mém. Soc. méd. d. hôp. de Paris **35**:274 (Feb. 6) 1913; Lymphogranulomatose inguinale subaiguë, ulcère vénérien adénogène, Presse méd. **30**:571, 1922; abstr., Arch. Dermat. & Syph. **7**:238 (Feb.) 1923.

2. Frei, W.: Eine neue Hautreaktion bei Lymphogranuloma inguinale, Klin. Wchnschr. **45**:2148, 1925.

3. Wolf, J., and Sulzberger, M.: Lymphopathia Venereum, Brit. J. Dermat. **44**:192, 1932.

4. Hellerström: A Contribution to the Knowledge of Lymphogranuloma Inguinale, Acta dermat.-venereol., supp. 1, p. 5, 1929.

Van Cleve,[5] Sulzberger and Wise,[6] Stannus [7] and Zakon,[8] to mention but a few. However, there still seems to be a paucity of information available in the American literature relative to the late manifestations of the disease, occurring in women as esthiomene, a chronic ulceration of the vulva with elephantiasis, the genito-anorectal syndrome, often referred to as anorectal syphiloma, and a certain type of rectal stricture, and in men as elephantiasis of the penis and scrotum.

The several manifestations which constitute the genito-anorectal syndrome have long been recognized clinically, but in the past have always been ascribed to various specific infections. Foremost among these was syphilis, but the absence of evidence of syphilitic infection and the negative serologic tests in many instances, on the one hand, and the failure of the lesions in patients with positive serologic tests to respond to the administration of adequate antisyphilitic treatment, on the other hand, materially lessened the importance of syphilis as an etiologic factor. The formation of abscesses and fistulas in the perineal and para-anal regions and the presence of giant cells in the inflamed tissues led to the belief that tuberculosis was the causative agent. Gonorrhea, chancroid and many other infections, some nonvenereal, have at one time or another been considered as possible etiologic factors, but none have been satisfactorily proved.

The Frei test has, however, established the identity of these conditions and has stimulated research directed toward the etiologic factor. Up to the present time no culturable, visible organism has been discovered as the etiologic agent of lymphopathia venerea, but successful inoculations of man and animals with both infectious materials and filtrates, as demonstrated by Hellerström and Wassen,[9] seem to have proved definitely that the infectious agent is a filtrable virus.

Frei,[10] in summarizing the knowledge of the genito-anorectal syndrome in 1932 expressed the belief that the syndrome in part or as a whole is commonly the result of an infection by the virus of lymphopathia venerea, but apparently was not convinced that the manifestations

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5. De Wolf, H. F., and Van Cleve, J. J.: Lymphogranuloma Inguinale, J. A. M. A. **99**:1065 (Sept. 24) 1932.

6. Sulzberger, M., and Wise, F.: Lymphopathia Venereum, J. A. M. A. **99**: 1407 (Oct. 22) 1932.

7. Stannus, H. S.: A Sixth Venereal Disease, London, Baillière, Tindall & Cox, 1933.

8. Zakon, S. J.: Lymphogranulomatosis Inguinalis or Durand-Nicholas-Favre Disease, Arch. Dermat. & Syph. **26**:238 (Aug.) 1932.

9. Hellerström, S., and Wassen, E.: Internat. Cong. Dermat. & Syph., Copenhagen, 1930; quoted by Stannus,[7] p. 79.

10. Frei, W.: Der gegenwärtige Stand der Kenntnisse von der Elephantiasis genito-anorectalis (Esthiomène, entzündliche Rectumstriktur), Deutsche med. Wchnschr. **58**:1964, 1932.

are due to the presence of the living virus in the involved tissues. He suggested that the reaction of the tissues might be the same as that seen in the skin reacting positively to an inoculation with antigen and that in sensitized tissues nonspecific excitants might produce the same changes. Koch,[11] however, demonstrated experimentally the relationship between lymphopathia venerea and esthiomene. He prepared an extract of a piece of proliferating tissue from the genital zone of a patient with typical esthiomene (positive Frei reaction) and injected the extract intracerebrally into an ape, in which there developed specific lymphogranulomatous meningo-encephalitis. This experiment revealed the fact that the infectious agent is still alive, even in the late stages.

The following report of a case is of special interest in view of recorded data extending over a period of ten years, which not only relate the clinical sequence of the genito-anorectal syndrome, but fortunately record histopathologic studies in the various stages of the syndrome and illustrate the significance of the Frei test, greater application of which, we feel, will reveal many heretofore undeterminable disorders and lead to a better understanding of this most complex syndrome.

REPORT OF A CASE [12]

History.—Mrs. V. L., aged 37, a Jewess, a widow, was admitted to the outpatient department of the Mount Sinai Hospital on Sept. 3, 1931, with the following complaints: an eruption on the chest and forearms, severe pain in the lower portion of the abdomen, weakness, constipation and poor appetite. These symptoms had all been present for several years, with the exception of the eruption, which was of several days' duration.

The patient stated that about fifteen years previously her husband had enlarged inguinal glands with numerous sinuses that were incised and drained. Several months previous to this he had a "pimple" on his penis, and was given antisyphilitic treatment, but received the treatments irregularly. About one year later, there developed a generalized eruption in our patient, and the Wassermann reaction of the blood was strongly positive. Treatment was instituted, but continued irregularly. In 1924 there developed some difficulty in defecation, for which she sought relief at one of the local hospitals. A résumé of that hospital's record is as follows:

Oct. 16, 1924: The patient complained of cramps in the stomach. She felt well until nine days previous to admission, when she took some magnesium sulphate because of constipation, but no results were obtained. She then took an enema, but the fluid was expelled through the vagina. She had suffered a similar attack three months previous to this.

A tumor of the rectum and a rectovaginal fistula were revealed. On proctoscopic examination the proctoscope entered for 4 cm., at which point a complete obstruction was encountered. The obstruction felt firm and thick. A small stric-

11. Koch, Franz: Experimentelle Untersuchungen über das Lymphogranuloma inguinale, Dermat. Ztschr. **65**:207 (Jan.) 1933.

12. The patient was presented before the Chicago Dermatological Society, Dec. 20, 1933.

ture opening was visible. There was a fistula into the vaginal wall. A colostomy was performed as the first stage in the treatment. The vaginal fistula was repaired. Vaginal scrapings revealed subacute interstitial colpitis.

On microscopic examination a small bit of squamous epithelium was detached from the remainder of the tissue. There was an increase in the fibrous tissue with compression and pyknosis with many nuclei. Scattered throughout the tissue was a diffuse infiltration with lymphocytes, plasma cells and eosinophils which in some places seemed to be more marked and perivascular. This was evidently a subacute inflammatory process, nonspecific, but somewhat suggestive of syphilis.

November 19: The patient was discharged from the hospital. The rectal stricture was not improved.

Jan. 7, 1925: The patient returned to the hospital. There was no change in the symptoms. There was a colostomy opening in the right side of the abdomen; the wound was clean.

January 9: Resection of 3 inches (7.6 cm.) of rectum was done. The stricture area was removed.

A pathologic examination was made of three irregular pieces of tissue measuring 3 by 2 by 2 cm. The surfaces were discolored. On section through two of them the submucosa and muscle layers were well demarcated. There were some small adjacent nodules of pearl-gray tissue. The other piece on section showed grayish tissue discolored in places.

Microscopically there was no mucosa present in any of the sections. What was evidently mucosal surface was covered by a compressed and, in places, degenerated, subacutely inflamed granulation tissue which was highly vascular and sometimes hemorrhagic. Below this were numerous collections of lymphocytes, sometimes arranged around the blood vessel and at other times apparently forming typical lymphoid follicles. The muscularis was distorted and its fibers separated by a chronic inflammatory reaction. In one section, in the muscularis, was a well marked giant cell with peripheral nuclei surrounded by a few lymphocytes. The serosal portion was edematous. There were a few fat cells present in the submucosa. In another section was an area which morphologically was similar to a histologic tubercle. In this there were three giant cells with peripheral nuclei and the beginnings of others surrounded by a loosely arranged cellular envelop consisting of a few vesicular nucleated cells, but mostly lymphocytes. Other areas suggested this, but were not so apparent. The giant cells in these areas were not so marked. The areas were situated in and above the muscularis, which was distorted. The increase in fibrous tissue in this section was quite marked. It seemed possible that the stricture was of tuberculous origin and had become inflamed on its mucosal surface.

March 6: The patient reentered the hospital for closure of the original colostomy.

In 1926, the patient's husband died of heart disease and syphilis.

Oct. 12, 1931: The patient returned to the hospital because of difficulty in defecation. She stated that the stools were normal in color, but thin in diameter. Examination revealed that a vaginal piece of the frenulum was torn loose to bridge the lowest part of the introitus. A hard mass was palpable in the rectum, and about 3 or 4 cm. up in the rectum was a sclerosis caused by a hard growth.

Under ethylene anesthesia the stricture was dilated, first by the finger and then by the use of instruments of increasing size, until it was dilated to approximately the size of the rectum.

Treatment for the syphilitic infection was carried out irregularly throughout the entire period between hospital visits. After leaving the hospital she again resumed the antisyphilitic treatment. The rectal stricture, however, was not relieved by either the operations or the treatment of the syphilitic infection.

Treatment and Course.—On admittance to Mount Sinai clinic in September 1931, the Wassermann reaction of the blood was negative, but in view of the history, a provocative Wassermann test was performed which gave positive results. Treatment was instituted with alternating and combined courses of neoarsphenamine, bismuth and iodides. Permission to make a spinal puncture was refused. Three full courses of treatment, consisting of a total of 3.9 Gm. of neoarsphenamine and 24 grains (1.2 cm.) of bismuth salicylate per course were administered. Wassermann reactions of the blood following each course of treatment and at three month intervals since the last course of treatment (Dec. 14, 1932) have all been negative.

In March 1932, the patient complained of a painful swelling of the labia and stated that she had noted a slight ulceration for about four years. Examination revealed a large ulceration of the left labia minora with elephantiasis, and she was referred to the gynecological department for consultation. The opinion was that it was probably of syphilitic origin.

Antisyphilitic treatment was resumed and continued until Dec. 14, 1932, with no improvement in the lesions, although the serologic tests were negative. Permission to perform a spinal test was again refused. The patient was again seen on March 22, 1933, after an absence of three months. The elephantiasis and ulceration of the vulva were aggravated, and the patient still complained of distress on defecation.

On March 29, a Frei intracutaneous test was performed, and forty-eight hours later was strongly positive. The test was repeated on April 17, with another antigen, and in forty-eight hours was strongly positive.

From May 22 to July 31, eight subcutaneous injections of the Frei antigen were given without an appreciable improvement in the condition.

The Mantoux test (1 : 10,000) and the Wassermann reaction of the blood were negative.

Because of the discomfort and pain that the patient was suffering, especially on walking or sitting, and the complete failure of specific therapy, she was referred to the surgical department. On November 17, a simple vulvectomy was performed.

On November 25, the laboratory reported: The Wassermann (Kolmer) and Kahn reactions of the blood were negative. Cervical smears revealed many gram-positive lancet-shaped diplococci. Examination of stools revealed no evidence of Endamoeba histolytica on direct preparation or on twenty-four hour culture. The sputum on direct smears and antiformin preparation with Ziehl-Neelsen stains was negative for acid-fast bacilli. The urine and the blood count were normal. Roentgen examination of the chest revealed no abnormality.

Following the operation, the patient made a complete and uneventful recovery and was able to resume her occupation as seamstress after having been disabled for three years. Rectal symptoms, however, are still present.

Pathologic Examination.—The specimens removed at operation and submitted to Dr. I. Davidsohn, director of the department of pathology of Mount Sinai Hospital, showed the following changes.

Gross Appearance: The specimen consisted of a large portion of the left labium minus and a narrow strip of the right labium. An irregularly shaped shallow ulcer was present on the left labium, measuring about 20 mm. in the largest

diameter. The edges were sloping. The consistency of the base of the ulcer and of the entire surrounding tissue was firm, and on the section surface they appeared white. The right labium also appeared thickened and infiltrated.

Microscopic Observations: Sections from the ulcer on the left labium showed a thick leukocytic and fibrinous exudate covering the surface. Underneath was a young granulation tissue, with many giant capillaries, fibroblasts and newly formed connective tissue, and in addition, there was dense infiltration with plasma cells and lymphocytes extending deeply into the underlying tissue. Deeper down this change was followed by the presence of nodules, consisting of lymphocytes and epithelioid cells and many giant cells, with many peripherally located nuclei surrounding a pink-staining homogeneous material. The giant cells lacked, on careful examination, the characteristic qualities of tuberculous giant cells. The absence of caseous necrosis was striking, although occasional foci of necrosis were present. The granulomas were present through the entire thickness of the specimen. Some thickening of the intima of the arteries was also present. The granulomas and a dense infiltration with plasma cells were also present in the areas which were covered with normal-appearing, though hypertrophied squamous epithelium. The tissue was hyperemic. In some places there was a necrotic, pink-staining tissue in the center of a large granuloma.

Sections from the right labium showed the identical change found in the left labium except that the infiltration was less marked. Instead there was diffuse serous edema.

Numerous sections were studied for the presence of tubercle bacilli, but none were found. A careful search for Spirochaeta pallida was also not successful.

The original impression was that of tuberculosis, but as a result of further histologic and bacteriologic studies, and particularly after consultation with Dr. Fred Weidman of Philadelphia, the final diagnosis was lymphogranuloma inguinale.

CONCLUSIONS

We feel that this case merits reporting in view of the uncertainty which still exists relative to the acceptance of the lymphopathia venerea virus as the causative agent in many cases of the genito-anorectal syndrome and especially in instances of dual infection. We wish to emphasize the value of the Frei test and to advocate a more widespread use of the test as a routine diagnostic procedure in all cases of the genito-anorectal syndrome.

In the treatment of esthiomene, we feel that vulvectomy should be given due consideration until a more specific treatment for lymphopathia venerea has been developed, which may possibly obviate the necessity of surgical intervention.

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POSTENCEPHALITIC TROPHIC ULCER

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No mention is made in the American literature of trophic ulcers developing after an attack of and presumably as a result of central or peripheral nerve changes in epidemic encephalitis. Because of this and the difficulty encountered by several physicians in its diagnosis and treatment, the following report is made.

REPORT OF A CASE

W. M. H., a well developed, well nourished white man, aged 40, was referred to the department of dermatology and syphilology of the Graduate School of Medicine of the University of Pennsylvania on Nov. 8, 1933, with the request that he be given antisyphilitic therapy for an intractable ulcer which involved the cheek, nose and upper lip and which had destroyed the right wing of the nose. No diagnosis had been made, but it was thought, despite negative blood studies for syphilis, that the patient should receive the benefit of any doubt in the question of syphilis. Therefore, as requested, antisyphilitic treatment was instituted. He was given nine injections of a bismuth compound without the slightest apparent influence on the ulcer.

Dr. Ivy, who referred the patient, wrote that about two years previously the patient had been referred to his clinic by Dr. Pancoast and Dr. Pendergrass of the Undergraduate School of Medicine of the University of Pennsylvania for surgical treatment of a persistent ulcer of the upper lip and right nostril. The ulcer was the result of treatment of a carcinoma by electrocoagulation and radium. Repeated examinations for a malignant process in the ulcer had given negative results. The Wassermann reaction of the blood had also been repeatedly negative. During the period in which he was under Dr. Ivy's care, the ulcer was excised several times and the defect closed by sliding the tissues locally and also by flaps from the forehead and chest. In spite of all treatment, the ulcer returned. Dr. Ivy finally decided to refer the patient to the dermatologic clinic to see if a new treatment could be suggested and for a therapeutic test by a course of antisyphilitic medication.

When referred to Dr. Ivy, Dr. Pendergrass wrote that the patient had entered the roentgenologic clinic of Dr. Pancoast of the University of Pennsylvania on Nov. 25, 1929, for treatment of an ulcer on the right upper lip extending into the nostril. He gave a history of having had radium therapy and treatment with the electric needle without benefit. A biopsy specimen taken from the lesion was said to show carcinoma. The patient was treated with radium on Dec. 10, 1929. The lesion improved, but did not heal entirely, and therefore the area was desiccated on

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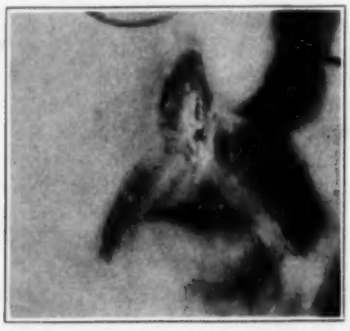
The patient was presented before the Philadelphia Dermatological Society, March 16, 1934.

Aug. 12, 1930. The entire lesion was removed by electrothermic coagulation, in the hope that a better blood supply would be obtained, plus healing, but that did not occur.

In January 1931, the patient was referred to Dr. Robert Ivy. In January 1933, two years later, Dr. Ivy wrote that in spite of everything he could do, it had been impossible to cause healing of the lesion.

The medical history was important, for the patient had had epidemic encephalitis in 1918. There was, therefore, an intervening period of eleven years between this and the development of the ulcer.

Physical examination revealed a well developed man without apparent abnormalities in the chest or the abdomen. Blood chemistry, serologic studies and urinalysis gave negative results. His expression, however, was peculiar; he held his mouth open constantly and there was a tendency to the blank look common to parkinsonism. He was referred to the neurologic clinic for an examination, which one of us (B. J. A.) made. His pupils were small and regular, but reacted to light. There was some limitation of movement of the left internal rectus muscle. Both eyeballs seemed to be limited in their upward movement, but the right moved



A postencephalitic trophic ulcer of four years' duration.

higher than the left. There was a slight disturbance in convergence. The facies were smoothed and expressionless. The speech was monotonous. There was rigidity with a cogwheel phenomenon in the right arm and also rigidity of the right leg. The right arm was held flexed, and did not swing on walking. He walked fairly rapidly. The right knee jerk was hyperactive. He had postencephalitic parkinsonism. In the ulcer, there was some decreased pain sensation on the edge of the ulcer and on the right portion of the upper lip. There was occasional miscalling of pain on the right side of the nose and for a short arc beyond the ulcer, but it was not great and on repeated testing sensation did not differ from the normal. It was not possible, however, to make any sensory observations not explainable by the cicatrix due to the operation or to the development of the ulcer.

The ulcer, which was moderately deep at the center and very shallow at the periphery, was slightly smaller than a twenty-five cent piece. It was irregularly oval and was located in the region where the right ala nasi had been. It extended in part over the cheek and in part over the upper lip (figure). The borders were well defined and sloping, and the base was soft. The floor was covered partly by a crust and partly by a seropurulent discharge, beneath which could be seen

a fairly red irregular surface. Aside from the fact that the ulcer caused no pain, one was able to press fairly firmly on the entire ulcerated area with an applicator without eliciting more than slight tenderness. It was apparently almost completely anesthetic, but the patient appeared generally apathetic, and possibly had a generally high sensory threshold. It was surprising to see an ulcer of this extent lacking in both pain and hyperesthesia. The lesion had neither enlarged nor decreased in size in the previous twelve months, although the patient readily admitted that he would, from time to time, pick off the crust. From the subsequent course of events, it appeared certain that the constant picking had much to do with the prolongation of the life of the ulcer.

Trauma, in all senses, even to the removal of crusts, was kept at a minimum. A 1: 10,000 solution of thiocresol was applied at frequent intervals, despite the fact that this had already been given the patient previously and for a long period without avail. Within two weeks there was a perceptible drying up of the ulcer with an apparent slight decrease in size. He was seen again on March 19, but there was no change. Roentgen therapy was started, with a 25 per cent dose at weekly intervals for four weeks, but this did not appear to have much effect, although by April 2, 1934, the lesion was dry and covered by a thin crust. Thiocresol therapy was continued. By June 19 the ulcer had practically healed.

The inclination to regard the ulcer as purely of traumatic origin because of its course toward healing after all local mechanical irritation was removed, was, however, in conflict with the entire history of the case, but it clearly indicates the importance of trauma in the development and prolongation of neurotrophic lesions.

COMMENT

The apparent rarity in epidemic encephalitis of trophic disturbances in the skin would appear to make the report of this case advisable.

It is generally believed that trophic ulcers are the result of two factors: (*a*) trauma, usually in the form of pressure, and (*b*) degenerative changes in the sensory and nutrient fibrillae of the affected nerves.[1] The latter factor is, of course, essential and occurs in connection with a number of diseases of the central and peripheral nervous system, but trauma (mechanical or infectious, or both) is of undoubted etiologic importance.

Current textbooks on diseases of the skin do not mention epidemic encephalitis specifically as one of the probable factors in the causation of neurotrophic ulcers, and there are no reported instances in the American literature of such a complication developing as an aftermath of epidemic encephalitis. In the German literature, however, several instances of postencephalitic trophic ulceration are described. Curiously enough, all the ulcers reported occurred in practically the same location, namely, the nasolabial groove. Itching at the site of the ulcer was a usual premonitory and accompanying symptom.

1. Savory and Butlin, quoted by Stelwagon, H. W., and Gaskill, H. K.: Treatise on Diseases of the Skin for Advanced Students and Practitioners, ed. 9, Philadelphia, W. B. Saunders Company, 1923, p. 658.

The first case was reported by Hoffmann,[2] in 1926. In the same year, Lammerman[3] reported a case; in 1929, Petzal[4] reported the third and Schlitter,[5] in the same year, reported the fourth. Lammerman's case was that of a woman of 27, who had a typical parkinsonian condition. She had an ulcer which involved the left nasal wing, extending to the bony part. Its edge was covered with a dirty brown crust and a sticky, yellow-brown, bloody secretion. The surrounding tissue was soft. The upper lip was depressed and swollen and had a superficial ulcer the size of a pea. Syphilis and tuberculosis were ruled out. A biopsy specimen showed edematous tissue with many dilated lymph spaces.

Schlitter's case was that of a boy of 14, in whom encephalitis developed in 1923, followed by a typical parkinsonian syndrome. In 1926, he contracted a cold and scratched his nose constantly. As a result, there developed an ulceration at the angle of the right side of the nose. Examination revealed the entire right nasal wing destroyed by a crater-like, granulating, bloody ulcer, the walls of which were slightly thickened. The ulcer extended to the mucosa of the nose. The granulations were soft. From its lower edge there extended another ulcer, which involved the upper lip, extending to the right corner of the mouth without involving the deeper structures of the right side of the upper lip. The inside of the nose was normal. Schlitter believed that the mechanical factor of scratching was important in the production of the ulcer, although he looked on the ulcer primarily as a late complication of encephalitis.

Hoffmann's patient was a young man of 27 who had an attack of grip, followed by typical parkinsonism. At the left nasal wing was a large ulcer which extended into the nasal cavity and into the gums. The ulcer was as large as a walnut, with thickened walls and a bloody crust. The nasal septum was involved in its inferior portions. There was, in addition, an extension of the ulcer which involved the gums and produced a sinking in of the upper lip. As a result of the involvement of the gums, the teeth from the first premolar to the first molar were destroyed. There was no clinical evidence of tuberculosis, syphilis or diphtheria. Histologic examination revealed no evidence of tuberculosis or syphilis.

The case reported here appears to be the first instance in America of trophic ulceration of the skin occurring during the chronic stages of epidemic encephalitis. Although the condition is benign, it is diagnostically important.

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2. Hoffmann, E.: Deutsche med. Wchnschr. **52**:238, 1926.
3. Lammerman, P.: Dermat. Ztschr. **47**:58, 1926.
4. Petzal, E.: Ztschr. f. Laryng., Rhin. **18**:49, 1929.
5. Schlitter, E.: Schweiz. med. Wchnschr. **59**:1121 (Nov. 9) 1929.

DERMATOMYCOSIS AND THE SOLDIER

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OMAHA

Ringworm of the feet is a common condition, the incidence ranging from zero in young children to almost 100 per cent in college athletes.

The average case of dermatomycosis pedis does not present a momentous problem, but nearly all, with increased exercise, heat, moisture or trauma, become acute from time to time. Acute cases are dangerous, because the fissures and denuded areas become portals of entry for the streptococcus, and many valuable training hours are lost while the patient reports to sick-call.

The following study was made at Fort Crook, Neb., in August 1932 at the Citizen's Military Training Camp. Through the courtesy of Major Carl Hutter, post surgeon, the feet of 123 regular enlisted men of the Seventeenth Infantry also were examined.

The diagnosis of ringworm was made on clinical manifestations only. Definite scaling was considered pathologic, and was taken as the basic type of lesion. Many candidates presented a complex picture. Many with eczema also presented fissures, and were classed as being eczematous only.

The candidates were all examined on the drill-field, and the type of infection was noted on the company roster. The records were then transferred to the tent roster.

All companies received the same amount of marching and footwork. Companies A and B used the same latrine and bath-house, while companies C and D used another. All candidates had been in camp three weeks when this survey was made.

Of the 123 regular soldiers, 24, or 19.5 per cent, exhibited the eczematous type of infection, and an additional 22, or 18.7 per cent, had fissures. Most of the regular troops presented the milder and more chronic types of infection, only 38.3 per cent showing the two major types. In Company A, with 112 candidates, 48, or 42.8 per cent, exhibited the eczematous type and 15, or 13.4 per cent, the fissured type without eczematization. Three were normal. In Company B, with 111 candidates, 46, or 41.4 per cent, had eczematous ringworm and 21, or 18.9 per cent, fissures and no eczema. Three were normal. In Company C, with 118 candidates, 62, or 52.5 per cent, had eczema and 30, or 25.4 per cent, fissures only. Three were normal. In Company D,

with 123, 29, or 21.7 per cent, showed eczematization and 43, or 34.9 per cent, fissures. Seven were normal.

The percentage of occurrence of the two major types of infection in the four companies was found to be: Company A, 56.2; Company B, 60.3; Company C, 77.9, and Company D, 58.9 per cent (the men in Company C were not examined by me; therefore this percentage is out of line with the other companies).

An analysis of findings revealed:

1. Of 464 candidates for Citizen's Military Training Camp examined after three weeks in camp, only 16, or 3.45 per cent, were clinically normal.

2. Acute eczematous infection, with or without fissures, was found in 185.

3. Companies A and B showed almost exactly the same percentage of acute eczematous eruptions.

4. Company D presented a little over half as many acute eczematous infections as did the other companies.

5. Company D showed twice as many men with the fissured type without eczematization as the other companies.

6. Sixty-three and two tenths per cent of all candidates presented the more severe types of infection (eczematous and fissured).

7. Company D had over twice as many with normal findings as any other company, although it was the largest.

8. In all companies there was a marked tendency for eczematous cases to exist in certain tents and for noneczematous cases to predominate in other tents.

Captain Frank Yates of Company D was the only commander who personally examined the feet of his command. Proper shoeing was obtained. The corporals were made responsible for daily inspection of the feet of all the men in their tents. Foot-baths were taken every other day at least. No other precautions were taken.

This undoubtedly accounts for the smaller number of eczematous cases in Company D, and demonstrates that accumulated perspiration and dirt may convert many moderately severe cases into eczematous ones. However, Company D presented twice as many cases with fissures as any other company, and taken together the two were as numerous in Company D (58.4 per cent) as in Company A (56.2 per cent) or Company B (60.3 per cent). Hence, cleanliness alone will not cure many cases of fungus infections of the feet, but because Company D had over twice as many with no clinical fungus infection, one can conclude that cleanliness helps to prevent this common infection.

1216 Medical Arts Building.

USE OF NITRITES FOR THE RELIEF OF PRURITUS

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Of the many drugs which have been advocated and used for the symptomatic relief of pruritus, gynergen [1] and histamine [2] have received most favorable attention in recent years. No reason based on sound pharmacologic principles has been assigned for their antipruritic action. Although it has been suggested that gynergen is useful because of the supposed relationship of pruritus to the sympathetic nervous system,[3] no proof has been offered to substantiate the hypothesis.

Since histamine causes dilation of the cutaneous capillaries it seemed of interest to determine the effect on pruritus of other drugs which also dilate the cutaneous blood vessels. Of these, the nitrites seemed best suited because their vasodilator action is profound, because they may be administered by mouth and are of low toxicity and because they are relatively inexpensive.

Three compounds, amyl nitrite, glyceryl trinitrate and erythrol tetranitrate were used. The mode of administration did not differ from that employed for the relief of pain in angina pectoris. Amyl nitrite was given in dosages of 0.2 cc. by inhalation. Glyceryl trinitrate was prescribed in tablets containing 0.0006 Gm. to be dissolved under the tongue, and erythrol tetranitrate was administered in doses of 0.03 Gm. by mouth. Since it was soon found that amyl nitrite was unsatisfactory because of its too evanescent action the following report includes only the cases in which glyceryl trinitrate and erythrol tetranitrate were employed.

Twenty-six cases of pruritus due to various causes were studied. These have been divided into two groups. Twenty-one are classified

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From the Department of Internal Medicine, Washington University School of Medicine, and the Barnes Hospital.

1. (*a*) Brack, W.: Ueber symptomatische und ätiologishe Behandlung bei vegetativen Functionsstörungen, Klin. Wchnschr. **9**:1534, 1930. (*b*) Lichtman, S. S.: Therapeutic Response to Ergotamine Tartrate in Pruritus of Hepatic and Renal Origin, J. A. M. A. **97**:1463 (Nov. 14) 1931. (*c*) Maier, H. W.: L'ergotamine, inhibiteur du sympathique étudié en clinique, comme moyen d'exploration et comme agent therapeutique, Rev. neurol. **1**:1104, 1926. (*d*) Lichter, A.: Ergot-Dispert in Treatment of Itching, München. med. Wchnschr. **80**:64, 1933.

2. Ernstene, A. C., and Banks, B. M.: Use of Histamine in the Treatment of Pruritus, J. A. M. A. **100**:328 (Feb. 4) 1933.

3. Brack.[1a] Lichtman.[1b]

TABLE 1.—*Generalized Pruritus*

Case	Sex and Age	Diagnosis	Duration of Pruritus	Drug and Dosage	Result	Comment
1	M 63	Hodgkin's disease of skin	2 mos.	Glyceryl trinitrate every 2 hours	Complete relief in 5 minutes	Usual cutaneous lotions tried previously without success
2	F 40	Essential pruritus	2 wks.	Glyceryl trinitrate every 2 hours	Complete relief in 5 minutes	
3	M 71	Lymphatic leukemia; leukemia cutis	2 yrs.	Glyceryl trinitrate every 2 hours and erythrol tetranitrate 3 times daily	Moderate relief 3 days' duration	After 3 days of moderate relief, nitrites became ineffective
4	M 41	Obstructive jaundice	4 mos.	Glyceryl trinitrate every 2 hours; erythrol tetranitrate every 4 hours	Complete relief	After 6 days of complete relief, the pruritus returned; medication discontinued for 2 days with complete relief again
5	F 24	Pompholyx	1 week	Erythrol tetranitrate 3 times daily	Complete relief	After 6 days of complete relief pruritus returned
6	M 5	Scabies	1 mo.	Erythrol tetranitrate 3 times daily	No relief	
7	M 45	Obstructive jaundice	4 mos.	Erythrol tetranitrate 4 times daily	Moderate relief	
8	M ?	Senile pruritus	.....	Erythrol tetranitrate 4 times daily	No relief	Marked vasomotor disturbance
9	F	Chronic urticaria	.....	Erythrol tetranitrate 4 times daily	No relief	No relief with other antipruritic medication including gynergen
10	F 30	Essential pruritus	1 week	Glyceryl trinitrate; erythrol tetranitrate 4 times daily	Complete relief within 5 minutes	No relief with previous administration of antipruritics
11	F 30	Urticaria	3 wks.	Erythrol tetranitrate 3 times daily	Practically complete relief	No relief with previous administration of usual lotions
12	M 50	Dermatitis medicamentosa	2 mos.	Erythrol tetranitrate 4 times daily	Moderate relief	Slight relief with histamine
13	M 35	Essential pruritus	3 mos.	Glyceryl trinitrate every 2 hours	Practically complete relief in 5 minutes	No relief with usual antipruritics, including histamine
14	F 60	Dermatitis herpetiformis	6 yrs.	Glyceryl trinitrate every 2 hours	Moderate relief	
15	F 45	Chronic urticaria	20 yrs.	Glyceryl trinitrate every 2 hours	Practically complete relief in 5 minutes	No other antipruritic effective
16	M 26	Urticaria	3 days	Glyceryl trinitrate every 2 hours	Moderate relief in 5 minutes	
17	F 50	Jaundice	2 mos.	Glyceryl trinitrate every 2 hours	Moderate relief in 5 minutes	Patient fainted after taking drug on one occasion
18	F 36	Urticaria	1 mo.	Glyceryl trinitrate every 2 hours	Complete relief in 5 minutes	
19	M 60	Exfoliative dermatitis	2 wks.	Glyceryl trinitrate every 2 hours	Moderate relief in 5 minutes	
20	F 20	Urticaria	3 mos.	Glyceryl trinitrate every 2 hours	Complete relief in 5 minutes	No relief with usual antipruritics
21	F 23	Generalized lichen planus	1 mo.	Glyceryl trinitrate every 2 hours	No relief	

as generalized pruritus usually caused by a systematic disease, while in the remaining six cases the pruritus was limited to a small portion of the body. In all the cases the itching was severe, and in most instances it was the major complaint of the patient. Unfortunately there are no objective signs which may be used in evaluating the results, and the only criterion is the word of the patient. To avoid the element of suggestion leading questions were never asked.

RESULTS

The results are given in the tables. Of twenty-one patients with generalized pruritus, ten received complete or almost complete relief

TABLE 2.—*Localized Pruritus*

Case	Sex and Age	Diagnosis	Duration of Pruritus	Drug and Dosage	Result	Comment
1	F	Pruritus valvae	2 mos.	Glyceryl trinitrate every 2 hours	No relief	
2	F	Pruritus vulvae	4 mos.	Erythrol tetranitrate 3 times daily	Moderate relief	
3	F	Pruritus vulvae	2 wks.	Erythrol tetranitrate 3 times daily	No relief	Marked vasomotor disturbance; medication discontinued
4	F	Pruritus vulvae	2 yrs.	Erythrol tetranitrate 3 times daily	No relief	
5	F 20	Impetigo of ear	3 days	Glyceryl trinitrate every 2 hours	No relief	
6	F 27	Eczema of hand	3 yrs.	Glyceryl trinitrate every 2 hours	Moderate relief	

and seven were moderately benefited, while the remaining four experienced no improvement. Of the six patients with local pruritus none had complete relief; two were moderately improved, and four received absolutely no benefit. It was therefore apparent that the nitrites were beneficial only for the group with generalized pruritus, and their use was soon discontinued in cases of localized pruritus.

Untoward Effects.—In two instances marked vasomotor disturbances forced the discontinuance of the drugs. One particularly nervous woman fainted when she noted the vascular effects. None of the remaining patients experienced more than a temporary discomfort.

Rapidity and Duration of Effect.—When relief was obtained the time of onset and the duration of effect were always in exact harmony with the known pharmacologic action of these drugs. Amyl nitrite when inhaled acted in from ten to fifteen seconds, but the pruritus usually reappeared after a few minutes. The effect of glyceryl trinitrate was noted within five minutes and usually lasted from one to two hours.

Erythrol tetranitrate given by mouth induced relief only after about thirty minutes, but its effect usually lasted from five to six hours.[4]

The onset of relief from itching occurred simultaneously with the appearance of the vascular phenomena. These consisted of blushing, redness of the face, throbbing in the head and occasionally headache. For this reason it is possible to foretell in a few minutes whether or not the drug will be efficacious in each particular case. If relief is not experienced at the onset of these symptoms no relief may be expected to occur.

Habituation, which usually developed after several days, prevented further antipruritic action.[5] Discontinuance of the drug for two days caused a return of effectiveness both in the control of itching and in the production of vascular phenomena.

In view of the perfect correlation between the clinical response and the known pharmacologic actions of the nitrites it appears improbable that suggestion had anything to do with the therapeutic effect.

Mechanism of Action.—Since the actual cause of pruritus is unknown, it is impossible to offer a rational explanation for its relief. In consideration of the vasodilator action of histamine and of the nitrites on the cutaneous vessels, it is suggested that the relief is in some way associated with this phenomenon.

CONCLUSIONS

1. In a series of twenty-one cases of generalized pruritus erythrol tetranitrate and glyceryl trinitrate gave complete or almost complete relief in ten cases, moderate relief in seven and no relief in four.

2. These drugs were almost completely ineffective in cases of localized pruritus.

3. The rapidity and duration of effectiveness were in accord with the known action of the various nitrites used.

4. It is suggested that the antipruritic effect is in some way associated with the dilation of the cutaneous vessels.

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4. Bradbury, J. B.: Some New Vaso-Dilators, Brit. M. J. **2**:1213, 1895.

5. Sollmann, Torald: A Manual of Pharmacology and Its Applications to Therapeutics and Toxicology, ed. 4, Philadelphia, W. B. Saunders Company, 1932, p. 507.

THE HIGH PATHOGENICITY OF A RECENTLY ISOLATED STRAIN OF SPIROCHAETA PALLIDA

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It appears to be generally accepted that repeated passages of Spirochaeta pallida are usually required for the development of pathogenic properties for the experimental animal, when first transferred from the human host. This view was widely expressed in the early literature on experimental syphilis, together with an explanation that it was a question of adaptation to a new environment. In some of the more recent work in this field, freshly isolated strains are also reported to be of low pathogenicity for the rabbit. Thus, Ecker [1] found that freshly isolated strains, as compared with older ones, produced a significantly smaller number of "takes," with a longer incubation period. There are instances, however, in which high virulence or unusual pathogenic properties have attracted attention even in the first animal passages. The best known example of this kind is the strain V of Nichols' series which was isolated in 1912 [2] and has since become a standard strain in many laboratories. More recently, also, Chesney and his co-workers [3] stated that two strains of S. pallida freshly isolated from human tissues were "highly virulent" for the rabbit. The relative frequence with which strains of low and of high virulence are encountered is still unknown, and this question is, of course, bound up with the larger one of whether or not the virulence or pathogenic properties of a given organism may be altered by environmental circumstances or whether they are characteristics of an inherently fixed nature. Before definite statements can be made with respect to these questions, a large number of strains should be isolated and studied under parallel conditions which permit of comprehensive and critical comparisons of their behavior. In this respect, virulent strains are particularly important

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1. Ecker, E. E.: Proc. Soc. Exper. Biol. & Med. **30**:671, 1933.

2. Nichols, H. J., and Hough, W. H.: Demonstration of Spirochaeta Pallida in the Cerebrospinal Fluid, J. A. M. A. **60**:108 (Jan. 11) 1913; J. Exper. Med. **19**:362, 1914.

3. Chesney, A. M., and Kemp, J. E.: The Curability of Syphilis, J. A. M. A. **88**:905 (March 19) 1927; Chesney, A. M.; Kemp, J. E., and Resnik, W. H.: Bull. Johns Hopkins Hosp. **35**:235, 1924.

on account of the opportunity which they afford for the making of comparisons based on positive rather than negative reactions.

The present report is concerned with observations made on the behavior of a strain of S. pallida which showed a high degree of pathogenicity in the first rabbit passages. A preliminary communication on the subject has been made.[4]

MATERIAL AND METHODS

Two experiments were carried out with a strain of S. pallida obtained in Peiping in the winter, 1931, from the inguinal lymph node of a Chinese patient presenting a fully developed eruption of secondary syphilis accompanied by a generalized lymphadenopathy. In both experiments the inoculum was a sterile saline emulsion of rabbit's testicle which showed well marked acute orchitis.

TABLE 1.—*Incidence and Mean Time* of Occurrence of Primary Orchitis, Critical Edema and Metastatic Orchitis*

			Primary Lesion		Critical Edema		Metastatic Orchitis	
Experiment	Group	Number of Animals	Incidence, per Cent	Mean Time, Days	Incidence, per Cent	Mean Time, Days	Incidence, per Cent	Mean Time, Days
I	I.T.†	10	100	15.1	60	22.0	80.0	46.6
	I.C.‡	8	100	17.3	..	....	87.5	50.4
	I.T. and I.C.	18	100	16.0	..	....	83.3	48.4
II	I.T.	9	100	19.7	44	26.5	100.0	51.6
	I.C.	9	100	21.3	..	....	88.8	60.0
	I.T. and I.C.	18	100	20.5	..	....	94.4	55.6
I and II	I.T.	19	100	17.3	53	23.8	89.5	49.2
	I.C.	17	100	19.4	..	....	88.2	55.6
	I.T. and I.C.	36	100	18.3	..	....	88.9	52.2

* Time calculated from the date of inoculation.
† Intratesticular injection.
‡ Intracutaneous injection.

Dark-field examination of the emulsion revealed from three to four actively motile organisms to the microscopic field. The same emulsion was injected into all rabbits employed in the same experiment. The animals, all males, were, as far as possible, equally distributed, with respect to number and breed, into twe groups: ten for intratesticular and ten for intracutaneous inoculation. Intratesticular injections were made unilaterally in the usual manner, 0.2 cc. of the emulsion being used. Intracutaneous injection was accomplished by means of a fine needle inserted into the dorsal penile skin and pushed to the mucocutaneous margin. Each animal received 0.15 cc. of the emulsion.

The first experiment was carried out in Peiping while the organism was in its fourth rabbit passage. All the animals employed were of a Chinese albino breed. The inoculations were made on March 10, 1932, and the animals were observed for three and a half months. The second experiment was carried out in New York, while the organism was in its sixth passage. The rabbits used in this instance were of various breeds, but chinchilla and Dutch predominated. This experiment was begun on Oct. 27, 1932, and was discontinued three months later. Of the total number of rabbits inoculated, thirty-six survived the

4. Hu, C. K., to be published.

periods of observation. There were four intercurrent deaths. At the same time that these experiments were in progress, others were being carried out in which "old" strains of S. pallida including the Nichols and Zinsser-Hopkins strains, were employed.

The criteria used for evaluating the pathogenicity of the organism may be summarized as follows: the incidence and the incubation period of the primary lesion, the critical edema and the metastatic orchitis, together with the time of appearance, the number and the distribution of the generalized lesions. The results were analyzed on the basis of mean values for each group of animals.

The results of the experiments are presented separately and in combined form in tables 1, 2 and 3. Table 1 contains a summary of the pertinent data on

TABLE 2.—*Incidence Rate and Mean Time* of Occurrence of Generalized Lesions*

Experiment	Group	Number of Animals	Incidence		Mean Time			Active Period
			Actual	Relative	All Lesions	First Lesions	Last Lesions	
I	I.T.†	10	8.2	7.4	56.2	42.1	72.9	30.8
	I.C.‡	8	7.5	7.5	57.9	50.1	72.0	21.9
	I.T. and I.C.	18	7.9	7.5	57.0	45.9	72.5	26.6
II	I.T.	9	8.3	8.3	62.1	50.8	69.4	18.6
	I.C.	9	6.2	6.2	59.0	55.6	77.3	21.7
	I.T. and I.C.	18	7.3	7.3	60.4	53.2	73.4	20.2
I and II	I.T.	19	8.3	7.8	57.7	45.3	71.2	25.9
	I.C.	17	6.8	6.8	59.9	53.0	74.8	21.8
	I.T. and I.C.	36	7.8	7.4	58.7	49.4	72.9	23.5

* Time calculated from the date of inoculation.
† Intratesticular injection.
‡ Intracutaneous injection.

TABLE 3.—*Incidence and Distribution of Generalized Lesions*

Experiment	Total Number of Lesions	Bone		Skin and Mucous Membranes		Eye	
		Number	Per Cent	Number	Per Cent	Number	Per Cent
I	134	39	29.1	89	66.4	6	4.5
II	131	79	60.3	52	39.7	..	...
I and II	265	118	44.5	141	53.2	6	2.3

the primary lesions, the critical edema and the metastatic orchitis. The rates of incidence in the animals and the mean times of occurrence of generalized lesions are shown in table 2. The data concerning the number and distribution of generalized lesions are given in table 3. As will be seen from the values in the tables, the disease of the first experiment was somewhat more severe than that of the second, but the results are sufficiently similar to be considered together.

RESULTS OF EXPERIMENTS

A primary lesion developed at the site of inoculation in all thirty-six animals, giving an incidence of 100 per cent, with a mean incubation period of eighteen and three-tenths days. The average time for the rabbits inoculated intratesticularly was seventeen and three-tenths days and for those infected intracutaneously nineteen and four-tenths days. Critical edema of the scrotum developed in ten, or 53 per cent, of the

nineteen animals given intratesticular injections;[5] its mean time of occurrence was twenty-three and eight-tenths days after inoculation. The incidence of metastatic orchitis for the thirty-six animals was 88.9 per cent, with a mean time of fifty-two and two-tenths days. In the case of the rabbits inoculated in one testicle, the time of occurrence of metastatic orchitis was shorter than in the animals given intracutaneous injections; the values were forty-nine and two-tenths and fifty-five and six-tenths days, respectively.

Generalized lesions were observed in thirty-five of the thirty-six animals, or 97 per cent. The number of lesions per animal varied considerably, as is usually the case, but the mean relative rate of incidence was 7.4. The mean time of appearance of secondary manifestations for the group given intratesticular injections was fifty-seven and seven-tenths days, for the group inoculated intracutaneously, fifty-nine and nine-tenths days and for the combined groups fifty-eight and seven-tenths days after inoculation. The so-called active period, or the time between the appearance of the first and the last generalized lesion, for the thirty-six animals was twenty-three and five-tenths days.

The distribution and the incidence of the generalized lesions are presented in table 3. Of a total of two hundred and sixty-five lesions, 44.5 per cent were in the bones and periosteum, 53.2 per cent in the skin and mucous membranes and 2.3 per cent in the eyes.

COMMENT

Beginning with the first generation of animal passage, the strain of S. pallida here described produced a relatively severe infection in the rabbit. For the first three generations only two rabbits were inoculated at each transfer. The results herewith presented confirm the early observations that at the outset the organism was highly pathogenic for the rabbit, and hence the process of adaptation, if such it was, was accomplished at once. When these experiments were carried out, the reaction to four strains well established in the rabbit, namely, the Nichols, the Zinsser-Hopkins and two Chinese strains, were also studied under identical conditions. The great similarity of the disease induced by the recently isolated strain to that induced by the older strains was particularly striking.

From the data shown in tables 1 and 2 it will be noted that the pathogenicity of the organism had not materially changed during the interval of seven and a half months which elapsed between the two experiments. In general, all phases of the disease paralleled each other rather closely. However, from the standpoint of the mean period

5. While local edema of the primary lesion was observed in the animals infected intracutaneously, the readings were found to be difficult and uncertain and are, therefore, omitted.

of incubation of the primary orchitis, the incidence and mean time of development of the critical edema and the mean time of appearance of the metastatic orchitis, the infection in the first group of animals inoculated intratesticularly was slightly more severe than that in the second. A similar difference is seen in the slightly higher relative rate for generalized lesions and in the considerably longer period of active infection. In the case of the animals inoculated intracutaneously, the same order of difference obtained in the mean periods of incubation of the primary lesion and the metastatic orchitis and the actual and relative rates of incidence for generalized lesions, but the active period of the disease was the same in the two series.

These results might be interpreted on the basis that with continued passage in the animal, the pathogenicity of the strain was not increasing, but was actually decreasing. However, since the experiments were carried out in two different localities, it is conceivable that a difference in geographic and meteorological influences produced the somewhat different results. From the information on generalized lesions summarized in table 3 it will be seen that one might consider that a qualitative change in the biologic activity of the organism had occurred during the interval between the two experiments. In the first place, it is to be noted that in the first series of animals there were six cases with ocular lesions, while there were none in the second. The use of different breeds of animals in the two experiments might have caused this difference, since Frazier and Mu [6] found that the rate of incidence of ocular lesions was higher in albino rabbits than in a colored breed. On the other hand, a more prolonged period of observation on the second group of animals might have revealed a number of ocular lesions, since it is known that such lesions usually develop late in the course of the infection.

In the second place, the relative distribution of lesions of the skin and bone was reversed in the two groups. This result might be an indication of a biologic change in the behavior of the organism itself, or it might arise from the difference in the animals employed. Rosahn [7] reported that in the English breed only 8.3 per cent of the generalized lesions were located in the skin, whereas in the Himalayan the incidence was 50.9 per cent.

Still another explanation suggests itself. It has been shown that within certain limits, the character of subsequent lesions is significantly affected by the character of previous manifestations. And it has been suggested that the reason for this phenomenon lies in the quality, the

6. Frazier, C. N., and Mu, J. W.: Proc. Soc. Exper. Biol. & Med. **27**:243, 1930.

7. Rosahn, P. D.: J. Exper. Med. **57**:907, 1933.

degree and the duration of immunity resulting from the earlier reactions.[8] The operation of the immune state is first seen in the regression of early lesions and subsequently in an interference in the development of later lesions with respect to time, number or character. When, however, later lesions appear, the character of the immune state is again altered, and the development of subsequent lesions is determined by its effectiveness. So far as is known, the sequence of clinical events that predominantly influence the existing and ultimate immunity of the experimentally infected rabbit are included in the orchitis, the bone and periosteal involvement and, finally, the manifestations in the skin and mucous membrane. In the present example, the primary lesions of the first experiment developed somewhat earlier than those of the second, and, in general, such a condition is associated with a more marked reaction of the tissue than is the case with later and less pronounced lesions. In such circumstances, the resulting immune response is also presumably greater. In consequence thereof, it would be expected that the next manifestations of the first experiment would be less pronounced than those of the second, and this was what actually happened, as is seen by the values representing the distribution of lesions in the bones and periosteum given in table 3: experiment I, thirty-nine lesions, or 29.1 per cent; experiment II, seventy-nine lesions, or 60.3 per cent. The effectiveness of the immune state in consequence of this phase of the disease would presumably be greater in the second than in the first experiment, and again this was the case, judging from the smaller number of lesions of the skin and mucous membrane which developed: experiment II, 52 lesions, or 39.7 per cent; experiment I, eighty-nine lesions, or 66.4 per cent (table 3). It is known that ocular manifestations are less subject to the influence of previous events than lesions of the skin and bones.[9] The results of the present experiments are in conformity with this knowledge.

Finally, it should be mentioned that the disease produced by intracutaneous inoculation was only slightly less severe than that produced through the intratesticular route (tables 1 and 2). A difference of this character is in general agreement with the usual expectation, but the point of interest in the present connection is that the difference was not greater than it was. This result furnishes additional evidence on the initially high pathogenicity of the strain for its new host.

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8. Brown, W. H., and Pearce, L.: The Defensive Reactions of Animals Infected with Spirochaeta Pallida, J. A. M. A. **77**:1619 (Nov. 19) 1921; The Resistance of (or Immunity) Developed by the Reaction to Syphilitic Infections, Arch. Dermat. & Syph. **2**:675 (Dec.) 1920.

9. Brown, W. H., and Pearce, L.: New York State J. Med. **23**:376, 1923.

SUMMARY AND CONCLUSIONS

In two experiments carried out on thirty-six rabbits inoculated by the intratesticular or the intracutaneous route, it was found that in its early passages from man, a recently isolated strain of S. pallida was highly pathogenic for its new host, the rabbit, as compared with older strains which have been carried in rabbits for many generations. From the beginning, the organism was well adapted to the conditions imposed by the new host. In the case of S. pallida, a successful adaptation to a new environment is usually considered to be contingent on a more or less prolonged sojourn in the animal. It is shown by the results here reported that this is not necessarily essential, and that while continued passage may modify the pathogenic properties of the organism in some respects, freshly isolated strains of S. pallida may manifest a virulence fully equal, or superior, to that of strains which have been carried in experimental animals for many years.

Correspondence

URTICARIA IN RELATION TO WEIGHT

To the Editor.—I am reporting the following case because of its unusual features:

About eight months ago, there was referred to me S. G., a college chemistry instructor, who presented a typical giant urticaria, with all of its distressing symptoms. The history was that about five days previous, out of a clear sky, the giant wheals had appeared, and they had been present almost constantly since then. The man's occupation immediately suggested a possible chemical etiology, although other causes were not ignored. The man was rather heavy, weighing about 230 pounds, (104 Kg.), and was about 66 inches (167 cm.) tall. The family and past histories were irrelevant.

Tbe patient was questioned carefully as to contacts, and intradermal and patch tests were performed, all of which took considerable time. During this period the condition in no way improved, the only relief being that given by local applications which acted symptomatically. The patient gave up in disgust, and I saw no more of him until two months ago.

He then informed me that he was free from symptoms and had himself discovered the cause of and cure for his condition. According to him, he had gone on a self-inflicted diet, omitting carbohydrates and fats, for the purpose both of reducing his weight and of perhaps clearing up the urticaria, his theory being that it was due to these foods. He observed that when his weight was reduced to 190 pounds (86.2 Kg.), the urticaria disappeared. He realized that this was so when he deliberately permitted his weight to increase again over 190 pounds and the urticaria promptly reappeared.

As he appeared very willing to show me that this was so, I weighed him on Aug. 18, 1934. At that time he was free from urticarial lesions and weighed 186 pounds (84.4 Kg.). He proceeded to eat freely, and on August 25 he weighed 189 pounds (85.7 Kg.). On September 1 he weighed 189½ pounds (85.9 Kg.). On September 4 he appeared at my office with a marked urticaria and weighed 192 pounds (87.1 Kg.). On September 9 he weighed 189 pounds, and the urticaria disappeared. At succeeding five day intervals, the dieting and weight were recorded. I definitely observed that a weight of 190 pounds or over caused a reappearance of the urticaria. Since October 10, the patient has been free from the condition, for his weight has been less than 190 pounds.

I can conclude only that there is apparently a disturbance in this man's body metabolism whenever his weight reaches a certain level, and that this disturbance manifests itself as outlined.

JACOB SPITZ, M.D., Boston.

DEMODEX FOLLICULORUM AND ACNE ROSACEA

To the Editor.—While the East-West battle of the demodex is raging, I should like to hurl my quota into the contest. I heard Dr. Ayres speak on acne rosacea in New Orleans. Since that time I have treated all my patients as he clearly outlined on that occasion. My results have been so successful that I agree with him that Demodex folliculorum is the cause of acne rosacea. Up to that time treatment had been unsatisfactory to me and costly and annoying to my patients. I invariably find Demodex folliculorum in acne rosacea and never in acne vulgaris.

I find it unnecessary to inflict on my patients the old-time dietetic or gastrointestinal remedies.

WILLIAM J. MACDONALD, M.D., Boston.

Abstracts from Current Literature

CUTANEOUS LESIONS IN RHEUMATIC FEVER. WILLIAM CHESTER and SIDNEY P. SCHWARTZ, Am. J. Dis. Child. **48**:69 (July) 1934.

In an epidemic of acute rheumatic fever observed in a ward of the Montefiore Hospital from March to November 1931, ten of twenty-one children showed cutaneous lesions as the predominating sign of the recurrence or exacerbation of rheumatic fever. The lesions were bluish and nontender and appeared mainly on the lateral surface of the legs and the extensor surface of the forearms. Most often they appeared as maculopapular purpuric spots and persisted for from one to six months. No scarring or desquamation followed their disappearance. During the period of observation such cutaneous manifestations were not observed in children without cardiac conditions in the ward.

The appearance of cutaneous lesions in children who have already had rheumatic fever should be considered a criterion of reactivity just as many other manifestations are now accepted.

AUTHORS' SUMMARY.

ACETARSONE IN THE TREATMENT OF SYPHILIS IN NEGRO CHILDREN. JOSEPH YAMPOLSKY, with the collaboration of DONALD F. CATHCART and INMAN SMITH, Am. J. Dis. Child. **48**:81 (July) 1934.

A detailed report concerning the treatment of sixteen Negro children with congenital syphilis with acetarsone is given. The conclusion is reached that peroral treatment of syphilitic children is coming back into use, because the advantage of medication by mouth is self-evident. Although Negro children show very little toxicity in the absorption of acetarsone, the report of many writers is of such character that it behooves one not to use the medication indiscriminately. The disappearance of the cutaneous lesions and the general improvement of the patients make the authors feel favorably disposed toward the oral use of acetarsone. A favorable effect is also shown by the serologic reactions and especially by reversal of the Wassermann reactions in Wassermann-fast patients. The roentgenologic results have not been gratifying. The status of acetarsone is still not definitely known. The authors do not believe that the drug per se without the use of other medications can cure syphilitic lesions of the bones and many other late lesions of congenital syphilis, but agree with other writers that acetarsone has a definite place in the treatment of congenital syphilis.

AUTHORS' SUMMARY.

CLINICAL ARSENICAL MYELITIS AND NEURITIS DUE TO ACETARSONE; REPORT OF TWO CASES WITH ONE DEATH; NEGATIVE OBSERVATIONS AT NECROPSY. JEROME GLASER, Am. J. Dis. Child. **48**:134 (July) 1934.

Two cases of clinical myelitis and peripheral neuritis occurring in infants during treatment for congenital syphilis with acetarsone are reported. In one case arsenical aphonia developed, from which the infant recovered. This infant also showed moderate contractures of the hands, from which he made a spontaneous recovery, and contractures of the lower extremities resulting in clubfeet, recovery from which occurred under orthopedic treatment. In the second case the infant died, apparently from the effect of acute arsenic poisoning on the central nervous system. Such slight lesions of the spinal cord as were demonstrable could not be differentiated from possible postmortem changes. For this reason, necropsy should be performed in such instances immediately after death.

Five other deaths due to acetarsone intoxication which have been previously reported in the literature are briefly mentioned.

The literature concerning arsenical myelitis and neuritis is reviewed, and from this it is concluded that arsenical myelitis should be considered as possibly the primary lesion in so-called arsenical peripheral neuritis.

Acetarsone should not be used indiscriminately in the treatment of known or suspected cases of congenital syphilis, and patients treated by this method should be kept under observation.

AUTHOR'S SUMMARY.

A NEW AUXILIARY TREATMENT FOR IMPETIGO CONTAGIOSA. LESTER HOLLANDER and JOSEPH J. HECHT, Am. J. Dis. Child. **48**:269 (Aug.) 1934.

The authors describe a new treatment for impetigo contagiosa, in which they use the following method of application: The surface of the skin surrounding the infected area is washed with soap and water and dried thoroughly with absorbent tissue. The lesion is painted with several layers of metaphen 1:500 in flexible collodion, which is permitted to dry layer by layer.

In twenty-four hours the easily removable layers of the metaphen-collodion mixture are removed with a tissue forceps. The adherent part is left on, and the mixture is reapplied in several layers. The procedure is repeated on the third day. On the fourth day all the metaphen-collodion preparation, which by that time has curled up at the edges, is removed, and with it the underlying encrustation. If the underlying skin is dry, light anointing with 2 per cent ammoniated mercury is carried out. If, however, the surface is still moist, the metaphen-collodion mixture is applied for another three days.

The advantages of this treatment are the ease of application and the impervious character of the dressings, easily confining the infection, so that auto-inoculability and contagion become less likely and thus the disease does not necessitate the exclusion of school children from their classroom activities, except in unusually severe cases.

ACETARSONE IN THE TREATMENT OF CONGENITAL SYPHILIS; A COMPARISON WITH BISMUTH THERAPY. JOHN F. COPPOLINO, Am. J. Dis. Child. **48**:272 (Aug.) 1934.

This article includes a brief review of the literature on acetarsone in the treatment of patients with congenital syphilis. A comparison of the effect of therapy with acetarsone and that with bismuth was made in 38 cases.

The author concludes:

1. Acetarsone, in the dosage recommended, is well tolerated by infants and children.

2. It is administered with ease. There was no break in the continuity of attendance with this plan of treatment.

3. It is extremely effective for young infants, both rendering them symptom-free and causing the serologic reactions to become negative.

4. It is not so efficacious in the treatment of older persons, being more useful in causing clinical improvement than in reversing the serum reaction.

5. It is equal to bismuth in its ability to heal lesions, but appears to be superior in its ability to bring about an earlier reversal of the serum reaction.

6. It appears to be the drug of choice for young syphilitic infants.

ECZEMA VACCINATUM. E. S. PLATOU, Am. J. Dis. Child. **48**:333 (Aug.) 1934.

This is the report of a fatal case of vaccinia in a 5 month old infant. A 3 year old brother had been previously vaccinated, and virus from the uncovered vaccination wound was presumably the cause of the infection. The vaccinia involved the face, where previous infantile eczema existed. Attention is called to the importance of extreme caution in vaccinating young infants who have open cutaneous lesions.

ANDERSON, Los Angeles.

TREATMENT OF VARICOSE VEINS. NORMAN J. KILBOURNE, Am. J. Surg. **25**:148 (July) 1934.

From a study of reports of 20 deaths which followed injections for the treatment of varicose veins Kilbourne has found that the majority were due to bacteriemia, bacterial phlebitis and/or embolism following bacterial phlebitis. Infection causes embolism because it produces an outpouring of proteolytic enzymes from bacteria and leukocytes, which rapidly digest and loosen the anchorings of a thrombus. To prevent infection the sclerosing solution should be one that is bactericidal, such as quinine urethane. It has been demonstrated that the hypertonic solutions of sugar and sodium chloride are not bactericidal and that the soap sodium morrhuate is not bactericidal for staphylococci or the colon-typhoid group of organisms. Emboli following quinine are extremely rare, for if phlebitis does occur it is a chemical rather than a bacterial phlebitis or venitis. The mechanism of protection offered by quinine is not clear. After injection most of the quinine is almost immediately adsorbed from the blood into the endothelium lining the blood vessels and remains there for a prolonged period. Quinine raises the surface tension of the body fluids wherever it is present, thus preventing phagocytosis. Digestion and loosening of the fibrinous thrombus do not occur, which prevents direct embolism. Thus quinine is recommended for injection in cases in which the veins are large and there is a greater danger of phlebitis and in cases with a past history of phlebitis. It is indicated also in some cases of cavernous hemangioma because quinine-ethyl carbamate affects analgesia. Sodium morrhuate should be used by the less experienced operator, especially when injections are made into small or thin-walled veins, because it is less likely to produce sloughs (it is painful when extravasated) and, should a slough occur, it will heal more readily and because it does not produce serious toxicity. Because of this relative freedom from toxicity sodium morrhuate may be used to obliterate cavernous hemangiomas in small babies in the case of whom the toxic reaction of quinine is feared. Kilbourne's practical report contains many other suggestions as to how danger in the treatment of varicose veins may be eliminated.

RATTNER, Chicago.

SARCOID OF BOECK (BENIGN MILIARY LUPOID) AND TUBERCULIN ANERGY. MARION B. SULZBERGER, Am. Rev. Tuberc. **28**:734, 1933.

Sulzberger reviews the classification of cutaneous tuberculous manifestations into three more or less well defined groups, tuberculosis, the tuberculids and the sarcoid group suggested by Lewandowsky, Jadassohn and Martenstein. In a woman with tuberculous sarcoid of Boeck and typical sarcoid infiltration of the lungs there was a lasting hyposensitivity or anergy to tuberculin. Microscopically there were naked epithelioid cell tubercles without many lymphocytes and without necrosis or caseation. No bacilli could be demonstrated. It is interesting to note that Boeck's sarcoid not infrequently affects other organs. Next to the pulmonary changes, the most frequent are the cystic changes in the phalangeal bones (absent in this case). Sometimes there are sarcoids of the spleen and liver and even a sarcoid-iritis.

CORPER, Denver. [ARCH. PATH.]

THE SENSITIZATION OF GUINEA PIGS TO POISON IVY. FRANK. A. SIMON, MARGARET G. SIMON and FRANCIS M. RACKEMANN, J. Immunol. **27**:113 (July) 1934.

Guinea-pigs were treated by rubbing a 10 per cent extract of poison ivy in petrolatum into their skins or by painting the normal skin with a strong extract. The authors found that the animals could be made sensitive to poison ivy by these methods. If the treated area of skin has any preexisting active lesions, such as those produced by cowpox virus, resulting sensitiveness is less marked. Response of the skin has been injured. The authors could not produce sensitiveness of the skin by injecting the extract intravenously or intraperitoneally. Sensitizing one area of the skin sensitizes all other areas of the skin at the same time. On the

basis of their experiments and from the experience of all previous workers, the authors believe that in man sensitiveness to poison ivy is acquired only by previous contact with the plant.

SEROLOGIC REACTIONS OF CULTURES OF MONILIA AND OF SOME OTHER YEASTLIKE FUNGI. LOIS ALMON and W. D. STOVALL, J. Infect. Dis. **55**:12, 1934.

The authors' experiments are based on the specific absorption of agglutinins by the virus Monilia. They found that, of a number of species of Monilia and related organisms, only two cultures of Torula were entirely specific in their antigenic characteristics. Mycoderma or Endomyces cultures left antibodies for species of Monilia only in antiserums for M. Albicans or M. candida. Absorption of Mycoderma, Endomyces, Saccharomyces and Willia antiserums by the three species of Monilia deprived these serums of agglutinins effective for the Monilia group, but left some capacity to agglutinate the non-Monilia cultures. Absorption of M. parapsilosis antiserums by M. albicans or M. candida, or by Saccharomyces cerevisiae, if the serum showed no titer for M. albicans or M. candida, left the serums specific for M. parapsilosis. In studies on absorption M. albicans and M. candida behaved as identical organisms. The diphasic existence of M. albicans and M. candida has not been demonstrated.

CORNBLEET, Chicago.

THE CAUSE OF DEATH IN INFANTILE ECZEMA. A. B. SCHWARTZ, J. Pediat. **4**:172 (Feb.) 1934.

The causes of death in ten infants who died after admission to the hospital for treatment of eczema included septicemia (in four cases), fulminating bronchopneumonia (in two) and intestinal intoxication (in two). In none was there an enlarged thymus. The author warns against the hospitalization of infants with eczema, because of their susceptibility to severe infectious processes.

CALCINOSIS UNIVERSALIS AND DERMATOMYOSITIS. COUNCIL C. RUDOLPH, J. Pediat. **4**:342 (March) 1934.

A case of calcinosis universalis in a 9 year old boy is reported. An illness, which was diagnosed as dermatomyositis, occurred previous to the deposition of calcium in the tissues. There are many references to the literature on this subject.

ERYTHRODERMIA DESQUAMATIVA. LEWIS WEBB HILL, J. Pediat. **4**:436 (April) 1934.

Twenty-one cases of erythrodermia observed by the author are discussed. In this condition the entire surface of the skin is red and somewhat moist, and usually there is considerable scaling. Frequently, the hands and feet are cold, blue and clammy. Boric acid ointment was found to be the best remedy for local application. The best results in treatment were obtained by a diet high in protein and low in carbohydrate and fat, such as partially skimmed milk with added carbohydrate and casein. The author considers erythrodermia to be a symptom complex occurring in seborrheic and eczematous infants, but not a distinct disease.

SIMPLIFYING THE PROBLEM OF INFANTILE ECZEMA: AN ANALYSIS OF 157 CASES. LEE BIVINGS, J. Pediat. **4**:494 (April) 1934.

One hundred and fifty-seven cases of eczema in infants, who were treated by the author, are reported. Skin tests by the scratch method are strongly advised in this condition and are considered to be reliable. Milk, eggs and cereal were the foods most commonly found to cause signs of sensitization. The author's chief principle in treatment consisted of removing the offending food from the diet. Local treatment consisted of the application of white petrolatum only. Complete recovery occurred in 78.5 per cent of the infants.

LEMASTER, Evanston, Ill. [AM. J. DIS. CHILD.]

RESULTS OF THE USE OF TYPHOID-PARATYPHOID A AND B VACCINE IN THE TREATMENT OF SOME SKIN DISEASES. I. S. GOLD, Brit. J. Dermat. **46**:176 (April) 1934.

The records of 105 patients with cutaneous diseases who received intravenous injections of typhoid-paratyphoid A and B vaccine during the years 1930 to 1933 were analyzed and are presented in four tables. There were 57 males and 48 females, whose ages varied from 13 to 70 years. One hundred and fifty-five injections were given, and the results in 38 cases are discussed. The usual dose employed was 0.125 cc. of typhoid-paratyphoid A and B vaccine. The present British standard states that 2 milliliters contains 1,000,000,000 typhoid and 500,000,000 paratyphoid A and B organisms, respectively. The cases reviewed received from 250,000,000 to 300,000,000 organisms at each injection. Gold believes that the true value of the treatment with typhoid-paratyphoid A and B vaccine remains an open question. In some cases the results are dramatic. No one type of lesion seems to be particularly susceptible to this form of protein shock. Of 38 cases receiving injections of typhoid-paratyphoid A and B vaccine only 32 improved, and included in this group were 6 cases of urticaria and angioneurotic edema, 4 of general pruritus, 4 of psoriasis, 4 of coccogenic dermatitis and boils, 4 of seborrhea, 2 of toxic erythema, 1 of general exfoliative dermatitis, 2 of actinic dermatitis, 1 of cheiropompholyx and 4 grouped as various. Two cases in the urticaria group, 2 of general pruritus, 1 of seborrhea and 1 case in the various group showed no improvement.

WIEN, Chicago.

PELLAGRA IN THE SUDAN (CONTINUED). N. L. CORKILL, J. Trop. Med. **37**:196 (July 2) 1934.

Wasting as a symptom was pronounced in most of the females with pellagra who were examined, but was observed in only a small proportion of the males. Weakness was present in about 50 per cent of all the cases. Dermatitis was commonly found on the palms and lateral aspects of the hands, the soles and their lateral aspects, the cheeks, the neck and the head around the ears and on the center of the forehead. On the nose, cheeks and forehead were areas of a sulphur-flake appearance, due to the extrusion of yellow secretion from the sebaceous glands.

Other symptoms were anorexia, glossitis, blueness of the gums, stomatitis, epigastric pain, flatulence, diarrhea, burning pain in various parts of the body, headache, lumbago, pains in the joints, formication, abnormalities of tendon reflexes and mental disorders.

The disease was definitely more frequent in the third decade in both males and females, the incidence being higher in males than in females after the age of 40. The period of highest incidence, recurrence and exacerbation was at the end of the dry season.

This section closes with a discussion of the various ways in which diet, particularly milk, can be a factor in the production of pellagra.

PELLAGRA IN THE SUDAN (CONTINUED). N. L. CORKILL, J. Trop. Med. **37**:214 (July 16) 1934.

The consumption of millet is considered in its possible etiologic rôle in the production of pellagra, and diet is suggested as an allergic factor. This instalment concludes with a discussion of all the symptoms formerly enumerated.

PELLAGRA IN THE SUDAN (CONTINUED). N. L. CORKILL, J. Trop. Med. **37**:245 (Aug. 15) 1934.

This instalment is devoted to the histories of patients whose examination formed the basis for the study of pellagra described in the preceding chapters.

JAMIESON, Detroit.

THE RELATIONHSIP BETWEEN VARICELLA AND HERPES ZOSTER. G. RENARD and P. HALBRON, Arch. d'opht. **51**:151 (March) 1934.

After presenting the arguments for and against the identity of varicella and herpes zoster Renard and Halbron describe a personal observation which lends support to the hypothesis of a common origin. A boy, 6½ years old, was admitted to the hospital because of a penetrating wound of the cornea. He was allowed to be up and about the ward as soon as he was well enough. The day after his entrance a man was admitted with typical herpes zoster ophthalmicus. Two days later this man presented an eruption of the skin which it was thought might be varicella or a generalized herpes. The boy eighteen days after his admission presented typical varicella. No history of varicella in the immediate family or among the neighbors was obtainable. The boy was the only patient of his age in the ward. These observations make it appear that the man with herpes zoster had a herpetic eruption or varicella fourteen days (the normal period of incubation) prior to the development of varicella in the boy.

MARLOW, Syracuse, N. Y. [ARCH. OPHTH.]

SCLEREMA-LIKE CHANGES IN THE SKIN. KARL RUPILIUS, Arch. f. Kinderh. **101**: 91 (Jan. 31) 1934.

The clinical picture and pathology of sclerema, scleroderma and scleredema are discussed. A case of scleredema in a 20 month old boy is reported. The fundamental pathologic picture consists in chemical and physical changes in the colloids of the subcutaneous connective tissue. The etiology has not been definitely established.

CAPILLARY MICROSCOPY IN ERYTHEMA NODOSUM. DÉNES V. MÓRITZ and EMIL V. LEDERER, Arch. f. Kinderh. **101**:101 (Jan. 31) 1934.

The capillary changes in fifteen cases of erythema nodosum in children were studied throughout the course of the disease. All the children showed positive tuberculin reactions. The changes in the capillaries of the nodules of erythema nodosum were similar to the changes in the capillaries of the skin at the site of a positive tuberculin reaction. These observations support the assumption that the two reactions are of similar etiology.

LEMASTER, Evanston, Ill. [AM. J. DIS. CHILD.]

INFLUENCE OF VITAMINS ON ACUTE INFECTIONS. HANS JOACHIM LAUBER, Beitr. z. klin. Chir. **158**:633, 1933.

The author has previously shown that the addition of vitamin A causes definite improvement in the healing of wounds. He also believes after experimentation that this vitamin influences acute infections favorably and that surgeons should understand and use vitamin therapy, whenever indicated.

RUBIN, Boston. [AM. J. DIS. CHILD.]

MELANOSIS OF THE COLON DUE TO BISMUTH. G. MICSEL, Beitr. z. path. Anat. u. z. allg. Path. **92**:146, 1933.

Micsel describes the gross and histologic observations in two cases of melanosis of the colon due to bismuth. The patients had received injections of bismuth compounds in the treatment of syphilis. The finely granular, brownish-black pigment, which was situated chiefly in the capillary endothelium of the mucosa, gave the chemical reactions of bismuth.

SCHULTZ, Evanston, Ill. [ARCH. PATH.]

HEMORRHAGIC AGRANULOCYTOSIS. E. NACHTNEBEL, Beitr. z. path. Anat. u. z. allg. Path. **92**:156, 1933.

Under the name "aleukia haemorrhagica" Nachtnebel reports three cases of agranulocytosis in which hemorrhage was a feature. In two cases there was marked aplasia of the bone marrow. The patients were receiving treatment with arsphenamine for syphilis when the terminal illness developed. He ascribes the changes in the bone marrow, to which sepsis was secondary, to the action of arsenic. In the third case sepsis was the primary factor. Massive roentgen irradiation of the long bones of dogs led to a condition clinically and anatomically similar to human agranulocytosis.

EXPERIMENTS ON THE RESISTANCE OF THE VIRUS OF HERPES. H. HRUSZEK, Dermat. Wchnschr. **98**:73 (Jan. 20) 1934.

A series of experiments was undertaken to determine whether the blood serum or the spinal fluid destroyed the herpes virus. Virus-containing material was mixed with serum and with spinal fluid, and inoculations were made after four, eight, twelve and twenty-four hours. Up to eight hours little or no destructive action was noted. Twenty-four hours of exposure destroyed the infectivity of the material. From these experiments it is concluded that the virus may be transported to various portions of the body by the blood stream.

L. TAUSSIG, San Francisco.

SPIROCHETE VACCINE IN THE TREATMENT OF SYPHILIS. EDUARD NEUBER, Dermat. Wchnschr. **98**:229 (Feb. 24) 1934.

Neuber states two reasons for the fact that immunotherapy has been given so little attention: (1) the difficulties encountered in the culture of Spirochaeta pallida and (2) the progress in chemotherapy. The first factor has been overcome by Hilgermann, who, after years of effort, has succeeded in finding a way to put Spirochaeta pallida through several passages, reduce its pathogenicity and even produce avirulent spirochetes that are suitable for active immunization. In Neuber's clinic 215 syphilitic patients were treated with Hilgermann's spirochete vaccine. Forty-two were treated in the beginning only with the vaccine (three times at intervals of two weeks), but later the vaccinations were combined with injections of bismuth compounds and of neoarsphenamine. In the other 173 patients the specific and chemotherapeutic treatments were combined from the beginning. The total number of vaccinations varied in different cases between one and ten, the majority of patients receiving three or four. The initial dose was generally 1 or 1.5 cc., and this amount was gradually reduced to 0.1 cc. and less. The vaccine was administered subcutaneously (upper arm), rarely intramuscularly, and only a few times intracutaneously. The reactions following the injections of vaccine usually became slighter after the later injections. Severe focal reactions were noted in 56 of the 215 patients. General reactions were noted particularly after the larger doses of vaccine. The author reaches the conclusion that the treatment with spirochete vaccine influences the immunobiologic apparatus of the organism, but he thinks that in early syphilis it is not sufficient to free the patient from the spirochetes. He relates the results obtained with the vaccine in 96 cases of neurosyphilis. A comparison of the results in these cases with those obtained with malariotherapy or with recurrent fever therapy reveals that the vaccinations with spirochetes were superior in regard to the production of complete remissions but inferior in regard to the production of slighter improvements. The mortality rate was higher after treatment with the spirochete vaccine, but this may be due to the fact that more of these patients were in an extremely weak and marantic condition. The number of progressive cases was larger after treatment with spirochete vaccine than after malariotherapy but only about half as large as after recurrent fever therapy.

[J. A. M. A.]

ETIOLOGY AND TREATMENT OF ACNE VULGARIS. DEZSÖ VON KÉMERI, Dermat. Wchnschr. **98**:237 (Feb. 24) 1934.

In 52 patients with acne vulgaris, von Kémeri observed pyogenic foci, positive Pirquet reactions and pulmonary changes. Following the removal of the pyogenic foci, the cutaneous changes disappeared spontaneously in 22 patients, and in the others the pyogenic character suffered a surprising change. Thirty patients were subjected to treatment with tuberculin following the removal of the foci. Twenty-seven were completely cured and 2 considerably improved, while 1 showed an exacerbation of the cutaneous symptoms. Other favorable effects noted in connection with the treatment were improvement of the appetite, increase in weight and cessation of gastro-intestinal and menstrual disturbances. Von Kémeri considers acne vulgaris a symptom of a combined tuberculous and pyogenic focal infection. He ascribes the chronicity of the disorder to the tuberculosis and the acute pyogenic eruption to the internal pyogenic focus. The activity of the pulmonary foci is proved by auscultation, percussion and, eventually, roentgen examination, but cutaneous symptoms likewise may indicate it. [J. A. M. A.]

GOLD THERAPY IN DERMATOLOGY AND THE DEMONSTRATION OF GOLD IN ORGANS. WOLTER, Dermat. Wchnschr. **98**:335 (March 17) 1934.

Wolter reports the use of a gold compound, aurothioglucose, in the treatment of pyodermia, ulcers on the leg and syphilis. One patient who had received a considerable amount of a gold compound for pyodermia died of pneumonia. Portions of the organs were sent to Gerlach, who determined the amount of gold present, as follows: kidneys, 147 and 142 gammas per gram; liver, 35, 31 and 27 gammas per gram; skin, 4 and 5 gammas per gram. The brain did not contain any gold.

TAUSSIG, San Francisco.

PATHOLOGIC HISTOLOGY OF AINHUM. YÜEN DJIN DSCHANG, Virchows Arch. f. path. Anat. **290**:648, 1933.

A brief survey of the conflicting views on the etiology and nature of ainhum is followed by a summary of the author's findings in the histologic study of toes in thirteen cases of the disease. The chief changes noted were diffuse fibrosis of all the tissues of the toe and hypertrophy of the overlying epidermis. These alterations were not histologically specific, but they were sufficiently characteristic to distinguish the process from leprosy and other diseases with which ainhum has been confused. No micro-organisms, fungi or parasites were seen in the tissue. The etiology remains unknown. The author surmises that the disease may be due to functional factors, either circulatory or nervous, that do not document themselves by characteristic tissue reactions.

HYPERTROPHY OF THE GUMS. F. GERLING, Virchows Arch. f. path. Anat. **291**: 522, 1933.

Gerling presents 2 cases of hypertrophy of the gums. In the first, that of a girl who died at the age of 10 years, the condition had been present since the fifth year of life. Previous to this time the child had had encephalitis followed by hemiplegia. In psychoses in which the mouth is held open, hypertrophy of the gums has been noted. The child began to menstruate at 7 years of age and exhibited other evidences of precocious puberty, supposedly the result of endocrine disturbance. In previously reported cases gingival hypertrophy has been ascribed to endocrine dysfunction. Gerling thinks that both factors may have played a part in this case. The enlargement of the gums was due to a diffuse increase in collagenous connective tissue, which did not appear to be inflammatory in origin. The differentiation of this condition from hyperplastic gingivitis is discussed. The second case was one of acute myeloblastic leukemia. The gingival hypertrophy was due to myeloblastic infiltration of the tissues of the gums.

TERTIARY SYPHILIS OF THE LUNG. K. SCRIBA and H. E. BÜTTNER, Virchows Arch. f. path. Anat. **291**:571, 1933.

A man aged 56 had had symptoms of chronic pulmonary disease for two years previous to his death. The Wassermann reaction was strongly positive. Roentgenograms taken at intervals during a period of eighteen months revealed nodular fibrosis of the lower lobes and multiple small miliary nodules of the upper lobes of the lungs. Anatomically the process was characterized by nodular and somewhat diffuse sclerosis of the lungs, which was most marked in the lower lobes, and by miliary gummas in various stages from an early phase to fibrosis. The continuous and progressive development of miliary gummas, evident both roentgenographically and anatomically, is considered the unusual feature of the case. The combination of miliary gumma formation and nodular sclerosis is held to be the result of the interaction of syphilis and pneumonoconiosis.

SCHULTZ, Evanston, Ill. [ARCH. PATH.]

THE CHARACTERISTICS OF FACIAL CANCER. E. PALJTSCHEWSKY, Ztschr. f. Krebsforsch. **40**:159, 1933.

This report is based on the study of 247 cases of facial cancer as observed at the Ukrainian Roentgen-Radiological Institute. All were studied histologically. The greater part of the cases occurred in peasants; next came those in laborers in industries involving chemical or thermal irritation. Two thirds were in males. As regards types of cancer, 49 were of basal cell type; these occurred mostly during the period of middle age. Nonkeratinizing squamous cell carcinomas occurred usually at an earlier age and formed 35 per cent of the cases, while keratinizing tumors of this type were observed principally at advanced ages and constituted 16 per cent. The basal cell tumors were located principally in regions rich in sebaceous glands, while the akeratinized squamous cell cancers were situated predominantly around the mucous orifices. With all types there was a relation to physiologic cutaneous atrophy. With the spinocellular cancers there were usually preceding changes in the epidermis, while with the basal cell variety these antecedent changes were more deeply located and either involved sebaceous glands or hair follicles or were of the type of comedones, acne or nevus.

EGGERS, Omaha. [ARCH. PATH.]

MODIFIED METHOD FOR THE QUANTITATIVE DETERMINATION OF BISMUTH IN THE URINE. KENSUKE MIYASAKI and TOSHIO OYAMA, Hifu-to-Hitsunyo **2**:150 (April) 1934.

The authors assert that their method, a modification of the method of Engelhardt (*Dermatologische Zeitschrift* **41**:287, 1924), is superior to the latter, in that with this method, amounts of bismuth as small as 0.1 mg. per hundred cubic centimeters and as large as 70 mg. may be measured and bismuth may be estimated in the presence of other metals, such as lead and mercury.

In the authors' technic the original Engelhardt method is followed as far as precipitating the bismuth (and other metals) as a sulphide after which it is collected on an ashless filter paper and washed several times with yellow ammonium sulphide water. The residue and paper are dissolved in hot dilute nitric acid, and then all traces of the nitric acid are thoroughly removed by desiccation. To the metallic nitrates thus secured water is added (this dissolves out the remaining metals and leaves as an insoluble residue only bismuth), and the insoluble bismuth nitrate is filtered out and again dissolved in nitric acid solution. To this is added a little galatin solution and the Leger reagent, resulting in a yellowish-red colloid solution which is ready for the colorimetric determinations.

The graduated colorimetric solutions are prepared by dissolving chemically pure bismuth nitrate (0.233 Gm.) in 100 cc. of 10 per cent nitric acid, the solution

thus prepared containing 1 mg. of metallic bismuth per cubic centimeter of solution. To graduated amounts of this solution is added 1 cc. of 5 per cent gelatin and 2 cc. of the Leger reagent, and the whole is diluted with water to make 10 cc.

A Case of Acanthosis Nigricans. B. Tominage and S. Harada, Jap. J. Dermat. & Urol. **36**:65 (July) 1934.

A farmer, 60 years of age, with moderate anemia, eosinophilia and renal insufficiency (Schlayer mild sugar test), with a rather small sella turcica and moderate vagotonia and sympathicotonia, began to show this dystrophy of th. skin two years before examination. At examination the head, with the exclusion of the hairy parts and the neck, chest, back, abdomen, hands and feet up to the region of the wrists and ankles were involved with the coarse papulation varying in texture from granular to warty and showing pigmentation and infiltration. Even the mucosae of the mouth cavity exhibited the peculiar papillary hyperplasia, without, however, showing any pigmentary changes. Interesting observations in this case were the parakeratosis of the palm and soles, atrophy of the sweat and sebaceous glands, and, histologically, segmentation, swelling and disarrangement of the elastic fibers of the upper reticular layer.

The cutaneous infiltration has been visibly lessened by roentgen treatment.

A Case of Pseudoxanthoma Elasticum with Tuberculoid Granulation Tissue. B. Tominaga, S. Harada and T. Hashimoto, Jap. J. Dermat. & Urol. **36**:79 (July) 1934.

A telegraph operator, 25 years of age, was tuberculous and had some sugar in the urine. The patch of pseudoxanthoma elasticum on the neck showed on histologic examination the typical breaking up, disarrangement and fragmentation of the elastic fibers, and, in addition, the elastic layer was infiltrated by masses of cells of tuberculoid granulation tissue and giant cells, some of which were typical Langhan's cells and others merely giant cells with irregularly grouped nuclei (Welti). Another patch, involving the lower abdominal, pubic and inguinal regions and extending down to the upper, inner aspect of the thighs, was in a less developed stage than the patch on the neck. The article is illustrated with excellent photographs.

Brennan, Chicago.

Therapeutic Effect of "Syphlose." K. Sugiwaka, Lues: Bull. Soc. japon. de syph. **10**:114 (Dec.) 1933.

One hundred and seven syphilitic patients, of whom five were in the secondary stage, sixty-five had latent syphilis and thirty-seven were in the tertiary stage, were treated with syphlose, and from the results obtained the following conclusions are drawn: Syphlose is able to clear up secondary syphilis clinically. It provokes manifest symptoms in latent and tertiary syphilis. Although secondary and latent syphilis may be cured by syphlose alone it is preferable to combine it with arsphenamine. Tertiary syphilis is difficult to cure with syphlose alone, and it is necessary to combine it with arsphenamine.

In cases of seronegative, doubtful syphilis it was possible to bring out manifest clinical symptoms by the injection of syphlose.

The slight pain of which some patients complained was absent after the fourth injection. No other marked untoward effects were noted.

Bloom, New York.

Society Transactions

AMERICAN DERMATOLOGICAL ASSOCIATION

Clinical Meeting, New York, June 9, 1934

HAROLD N. COLE, M.D., *President, Presiding*

MULTIPLE GIANT CELL SARCOMA OF THE EPULIS TYPE. Presented by DR. HOWARD FOX, New York.

This patient was presented before the New York Dermatological Society on March 27, 1934 (ARCH. DERMAT. & SYPH. **30**:745 [Nov.] 1934).

DISCUSSION

DR. J. GARDNER HOPKINS, New York: It is hard to see how these multiple soft tumors, which are bilateral and symmetrical and are limited to the hands, can be sarcomas. I hesitate to argue about the histology when I have looked at the section only for a couple of minutes. It is a long time since I have seen a giant cell sarcoma. The chief thing I remember is the staphyloid giant cells. In epulis tumors the cells have the same character. I wonder whether this condition might be xanthoma or something of that sort with a giant cell reaction.

DR. DAVID L. SATENSTEIN, New York: I did not get the impression of giant cell sarcoma of the epulis type. Such growths are usually fibromas with many giant cells. The tissue in this case is loose, undergoing some degeneration, and large, juicy giant cells are present. Clinically, giant cell sarcomas are few in number and may even be nevoid. The lesions presented by this patient are very soft. I believe that there are changes in the bone. I therefore suggest some unusual type of sarcoid rather than giant cell sarcoma.

DR. FRED D. WEIDMAN, Philadelphia: I do not believe that the condition is neoplastic, largely for the reasons Dr. Hopkins advanced, but beyond that the diagnosis is, with me, merely speculation. I should like to know the results of the general examination of the patient and whether focal infection is present, rheumatism in particular. If so, one can make a tentative diagnosis of rheumatic nodules. The lesions consist almost entirely of giant cells, which, as Dr. Satenstein said, distinguish them from epulis tumors and also from tuberculids and rheumatic nodules. However, the entire range of histologic change possible in rheumatic lesions of the skin is not known. One does not know everything today about Aschoff nodules, with their giant cells, and I believe from this little taint in the histologic picture that rheumatism is the most promising lead on which to start. I think this is one of the most interesting cases that has been presented today.

DR. LLOYD W. KETRON, Baltimore: I wish to support Dr. Hopkin's diagnosis and to suggest the possibility of Schüller-Christian's disease. The tumors of this variety of xanthomatosis often do not show the presence of fat in frozen section.

DR. HOWARD FOX, New York: I have not had an opportunity to study the patient thoroughly, as she has lately been confined to bed with arthritic pains. At a previous presentation both xanthoma and calcinosis were considered, though neither diagnosis was satisfactory.

A CASE FOR DIAGNOSIS (GRANULOMA? LICHEN NITIDUS?). Presented by DR. ISADORE ROSEN, New York.

Mary P., aged 65, Hungarian, presents a disorder of ten weeks' duration. She was well until there developed an eruption on the flexor and extensor aspects

of the upper extremities, with a few lesions on the chest and on the dorsum of each foot. The lesions gradually spread. In the early stages they were pruritic.

There is no evidence of a definite organic disease. There is no history of the ingestion of drugs, except mild saline laxatives. No subjective symptoms are present.

The eruption involves chiefly the upper extremities below the elbow, with one or two lesions on the left palm and a few on the chest and on the dorsa of the feet. Some of the lesions are grouped, some isolated. They vary in size from that of a pinpoint to that of a large pea and in color from that of normal skin to brownish red with a slightly violaceous tinge. Most of the lesions show a central depression (umbilication); some are annular, some oval and some semilunar. Some lesions are on a noninflammatory base, others on an inflammatory one. The larger ones especially have a distinct halo of brownish pigmentation. There is no evidence of scaling. In some areas there is a distinct tendency to linear arrangement, evidently along the line of scratch marks. Some of the larger lesions are raised, resembling small keloids. In the left cubital fossa is a group of lesions which vary in size from that of a pinpoint to that of a pinhead. These lesions are grayish white and resemble lichen nitidus. There are no lesions on the oral mucous membrane.

The Wassermann reaction was negative. The examination of the blood revealed: erythrocytes, 4,410,000; leukocytes, 8,000; hemoglobin, 91 per cent; color index, 1.03, and a differential count of 72 per cent polymorphonuclears and 28 per cent small lymphocytes. The urine gave a negative reaction for sugar; a slight trace of albumin was noted. Studies of the lipids of the blood serum showed: total lipids, 1,690 mg. per hundred cubic centimeters; total cholesterol, 243 mg.; cholesterol esters, 171 mg.; free cholesterol, 72 mg.; percentage of esters, 30, and lecithin, 262 mg. The calcium content of the blood was 12 mg.; the albumin content, 4.52 per cent and the globulin content, 2.79 per cent, all within normal range.

Histologically, there was moderate interstitial edema of the epidermis with some parenchymatous edema of the deep portion of the cutis. The papillary bodies were swollen. The papillary vessels were dilated and the subpapillary vessels were dilated and surrounded by a focal cellular infiltrate, which was limited to the epidermis. In the subpapillary zone, independent of the vessels, was a grouping of cellular elements entirely different from those about the vessels. There was considerable disorganization of the connective tissue of the upper portion of the cutis. The overlying epidermis was in part normal and in part thinned, probably owing to the underlying pathologic process.

The perivascular infiltration was predominantly lymphocytic. The walls of the vessels were edematous, the nuclei of some of the cells projecting into the lumen. In the subepidermal zone the infiltration, independent of the vessels, was composed of epithelioid cells with a few small multinucleated cells. In some sections a considerable number of the larger giant cells were present in place of the small cells. There were also some giant cells independent of the epithelioid cells.

There was no marked pathologic process in the overlying epidermis. There were no new blood vessels or new connective tissue.

The entire picture is one of the development of tubercle-like lesions, with a fairly marked exudative inflammation of the cutis.

The histologic observations suggest a diagnosis of granuloma annulare. Lichen planus can be ruled out.

No studies were made of the small lesions resembling lichen nitidus.

DISCUSSION

DR. FRED D. WEIDMAN, Philadelphia: I think that the condition is annular lichen planus. I saw the section, and what I said about the previous case applies here; i. e., it is not fully representative of a clinical lesion. The changes shown in the section do not account for the degree of infiltration shown in the lesions

clinically. Too much weight should not be placed on the observations on the histologic section, and the diagnosis of lichen planus is still open.

Dr. Oliver S. Ormsby, Chicago: My impression is that the condition is lichen planus. There are annular lesions that have a white rim. Some of the lesions suggest lichen nitidus, but taken all together, with the papules arranged in lines and circles as they are in lichen planus, they may represent an unusual type of this disease.

Dr. David Satenstein, New York: One always looks for lichen planus in this type of case. Here the epidermis shows no pathologic changes. On the basis of the disseminated epithelioid and giant cells with an inflammatory reaction, I am inclined to consider a diagnosis of a tuberculous process, possibly granuloma annulare.

Dr. Hamilton Montgomery, Rochester, Minn.: I examined several of the sections from these lesions in Dr. Satenstein's laboratory. They show more inflammatory reaction than do the sections presented here. There is an infiltrate about some of the deeper vessels, which tends to rule out lichen planus as well as lichen nitidus. The histologic picture is not typical of granuloma annulare.

A Case for Diagnosis (Granuloma Annulare? Sarcoid?). Presented by Dr. Isadore Rosen, New York.

N. LaC., a boy aged 8 years, has a disorder of three years' duration, the face, ears, trunk and upper and lower extremities being involved.

The patient was presented at the regular meeting of the Section of Dermatology and Syphilis of the Academy of Medicine on May 2, 1933, by Dr. Goodman of the Stuyvesant Square Hospital as having erythema multiforme haemorrhagicum bullosum (Arch. Dermat. & Syph. **28**:894 [Dec.] 1933).

When first seen at the clinic of the New York Post-Graduate Medical School and Hospital on April 9, 1934, he presented over the dorsa of the hands and on the forearms elevated, violaceous, rather well defined papular lesions, varying in size from that of a pea to that of a dime, some of which were waxy. The rims of the ears showed livid erythema with scaling and scarring. The lesions on the backs of the hands and on the buttocks resembled those of granuloma annulare.

Attention is directed to the unusually bad oral hygiene and the pathologic condition of the boy's teeth and gums. This may be a factor contributing to the dermatologic involvement. The condition has not changed much from that shown on his first visit in April 1934. Occasionally the lesions become inflamed and edematous.

The Wassermann reaction was negative. Examination of the blood serum for cholesterol revealed: total cholesterol, 100 mg. per hundred cubic centimeters, consisting of cholesterol esters, 50 mg., and free cholesterol, 50 mg.—a marked reduction from the normal values. Reactions to the tuberculin test were faintly positive.

Histologic examination of a biopsy specimen from the ear did not suggest a definite condition. Specimens from the arm and the leg were reported by Dr. Satenstein as being strongly suggestive of granuloma annulare.

DISCUSSION

Dr. John H. Stokes, Philadelphia: I am going to discuss this case, although an absolute diagnosis is at the moment impossible. Not long ago I saw a young girl on whom a chandelier had fallen, following which there developed lesions similar to those on the buttocks and thighs of the boy presented here. The appearance of the lesions fitted the picture described by Adamson as a tuberculid type of infiltration in the areas usually involved in livedo racemosa. The boy's lesions so closely resemble those of my patient that I suggest that they may be tuberculids.

Dr. S. E. Sweitzer, Minneapolis: To show the different impressions that the appearance gives to different persons, I think that the boy has sarcoid, on the basis of the lesions of the cheeks alone. I think that the lesions on the buttocks

are sarcoid of considerable duration. The section shown does not exhibit sarcoid formation, but it should be ascertained from what lesion the section was taken; and I wonder if a section taken now would not give a different picture.

Dr. David Satenstein, New York: Three pieces of tissue were examined: one from an active nodule, one from the gluteal regions and a third from the ear. The nodular lesion showed an inflammatory process, and scattered throughout this area were many epithelioid cells. The characteristic picture of sarcoid was not present. The other two sections, from the pigmentary zone on the buttocks and from the ear, showed granulation in the stage of organization. I think that from the slides it is not possible to make a diagnosis of sarcoid. The general appearance gave the impression of granuloma annulare.

A Case for Diagnosis (Morphea?). Presented by Dr. Eugene F. Traub, New York.

Mrs. M. K. presents a condition on both legs of eight years' duration. She was presented at the April 1934 meeting of the New York Dermatological Society and at the May 1934 meeting of the New York Academy of Medicine. Subsequent to these presentations the laboratory examination revealed: The cholesterol content of the whole blood was 125 mg. per hundred cubic centimeters; that of the serum 155 mg., and that of the plasma, 146 mg. A dextrose tolerance test (122 Gm. of dextrose in solution to make 200 cc.) gave the following results:

Time	Sodium Chloride, Mg. per 100 Cc.	Sugar, Mg. per 100 Cc.	Total Calcium, Mg. per 100 Cc.	Urea Nitrogen, Mg. per 100 Cc.	Uric Acid, Mg. per 100 Cc.	Carbon Dioxide, Cc. per 100 Cc.
Before	487.6	82.9	92.0	15.8	1.97	57.2
¼ hour	471.0	121.8	130.2	15.8	1.94	....
1 hour	479.3	136.9	143.4	16.2	1.91	....
1¼ hours	487.6	138.2	147.3	16.1	1.94	....
2 hours	471.0	97.6	109.9	15.8	1.9	....
3 hours	462.7	101.8	112.5	15.2	1.85	....
4 hours	471.0	66.0	76.4	14.7	1.84	61.5

DISCUSSION

Dr. Udo J. Wile, Ann Arbor, Mich.: I think that this condition may be diagnosed as the unusual disease which was, I think, first described by Urbach and to which he gave the name necrobiosis lipoidica diabeticorum. Two cases of this have been seen in Chicago recently and are to be reported before the Section on Dermatology of the American Medical Association by Dr. Zeisler. As I recall, in the original case of Urbach there was no ulceration. The lesions underwent cellular necrosis, and for this reason he called them necrobiosis. The cases seen in Chicago exhibit definitely ulcerated xanthoid lesions; and the absence here of diabetes does not necessarily rule out the diagnosis in this case, because diabetes or glycosuria may be potential, and it is possible that the lesions occur independently of existing diabetes.

Dr. S. E. Sweitzer, Minneapolis: I saw one of Dr. Zeisler's patients with necrobiosis lipoidica, and clinically this patient's condition looks as if it might fit that picture. The disease is supposed to have been described by Urbach, but I recently saw a letter from Oppenheim in which he stated that he showed Urbach the condition and Urbach later reported it, and now this name which he does not like has been attached to it. Dr. Michelson has two cases which he will report soon, at which time I think he will take up the question of nomenclature.

Dr. Lloyd W. Ketron, Baltimore: I have seen two cases clinically similar to this one. Histologically the lesions in one resembled a scleroderma-like sarcoid, while those in the other showed features suggesting granuloma annulare.

Dr. Hamilton Montgomery, Rochester, Minn.: Necrobiosis lipoidica diabeticorum must be considered seriously in this case on the histologic as well as on the clinical basis. There is marked necrosis in the connective tissue, surrounded by a nonspecific inflammatory reaction. Staining for fat will settle the question.

One must bear in mind that in necrobiosis lipoidica diabeticorum typical xanthoma cells are not present and fat is deposited in the areas of connective tissue necrosis, mostly extracellularly.

Dr. Eugene F. Traub, New York: I considered the three diagnoses that have been brought up in the discussion in the analysis of the case. Even without staining for fat I felt that the diagnosis of necrobiosis lipoidica diabeticorum could be excluded. Three biopsy specimens were examined before that diagnosis was considered, and I did not wish to press the patient for a fourth one before presenting her at this meeting. Urbach's patient stated that the eruption began as eczema, and for a time the condition was so diagnosed. The appearance of the eruption and the course of events in this case were different. The disorder started eight years ago with a deep nodule showing a slight elevation and only faint redness on the surface. As the disease progressed the lesions passed through the various stages usually noted in a patch of morphea, the only unusual thing being the yellow or yellowish-brown color and the marked telangiectasia that is present. This patient had a normal blood sugar content on a number of examinations and has normal tolerance for dextrose and, of course, normal urine. The physical examination gave essentially negative results. The unusual features noted in the report of the biopsies are the presence of giant cells and the suggestion of a tubercle-like structure. In view of the clinical course which resembles that of morphea more than that of any other entity, I presented the patient with a suggested diagnosis of morphea.

Hemolymphangioma of the Skin with Leiomyoma of the Deep Portion of the Derma and a Cavernous Angioma, Portions of Which are Becoming Sclerosed and Calcified. Presented by Dr. Eugene F. Traub, New York.

Mr. B. O., a youth aged 19, presents a condition that has been present all his life.

Roentgen examination of the left leg, including the knee and ankle, showed a slight waviness in the outline of the anterior border of the tibia in its upper portion. This appeared to be due to a slight thickening of the cortex at two points. With this exception the bones appeared to be normal in texture, in outline and in relationship to each other. In the soft tissues were several soft masses of various sizes and shapes and in various positions. The appearance suggested swelling in the soft tissue. In several places there were shadows indicating hard, calcified masses.

From infancy numerous nodular masses have been present, scattered about the left leg from slightly above the knee to the ankle. Some are rather superficial and soft and others are deep-seated and either soft and fluctuant or firm and hard.

Biopsy was made on May 29, 1934, an oval area of the skin, 2.5 cm. long showing macroscopically an elevated portion. On section there was seen an underlying firm growth 1 cm. deep containing many large blood vessels or spaces.

Microscopic examination of a section of the lesion, including the skin, revealed some hyperkeratosis and an irregular lengthening of the rete pegs. In the papillary layer and scattered through the lower part of the derma were large blood spaces, many of them filled with red cells, and a few lymph spaces which were enlarged or cystic, giving the picture of lymphangioma. There was considerable lymphoid infiltration, and in some of the spaces extravasated blood was seen. Beneath the region of the vascular changes was a fibrous area composed of bundles of collagen fibers interspersed with bands of smooth muscle, as seen by the Van Gieson stain. The appearance was that of leiomyoma. Many of the acini of the sweat glands were dilated.

Examination was made on June 4 of a biopsy specimen from the left leg, an oval area of skin 2 cm. long, beneath which, in the subcutaneous tissue, was a firm nodule 1.5 cm. long. On section this showed a large number of closely packed red areas which had the appearance of engorged blood vessels. These areas occurred in groups or lobules in the intervening fibrous tissue and in fibrous tissue surrounding the nodule. Portions of the tumor were composed almost entirely of these engorged vessels. The skin itself showed no unusual features.

Microscopic examination of sections of the tumor revealed groups of large, thin-walled blood spaces or vessels lying close together with fibrous stroma separating groups of them. In all of the spaces red blood cells were found, and some spaces were entirely filled by them. The surrounding fibrous tissue showed mucous degeneration and some lymphoid infiltration. There were also some small, thickened blood vessels and a large vein. The appearance was that of hemangioma cavernosa.

A Case for Diagnosis (Psoriasis?). Presented by Dr. Hans J. Schwartz and Dr. J. Frank Fraser, New York.

Mr. J. V., an Italian, aged 47, was presented before the New York Dermatological Society on April 24, 1934 (Arch. Dermat. & Syph., to be published).

A biopsy was performed on an early lesion on May 24, 1934, and Dr. Fraser's report of the histopathologic examination was as follows: The corneous layer showed parakeratosis in places and marked edema with vesiculation and cellular infiltration. The majority of the cells were polymorphonuclears. There was a similar appearance between the prickle cell and the corneous layer, viz., vesiculation and cellular infiltration. The prickle cell layer showed marked edema with vesiculation. In the upper portion of the corium the blood vessels were widely dilated, and there was a cellular exudate composed of lymphocytes, a few polymorphonuclear cells and eosinophils.

On May 25, a biospectrometric examination was made by Dr. Edward Gaul and Mr. A. H. Staud, who made the following report: The metallic elements in the biopsy specimen were present in normal quantities except for nickel and lead. The density of the nickel line was an equivalent of the density of the nickel line found in psoriasis. The density of the lead line indicated a 4+ retention.

DISCUSSION

Dr. S. E. Sweitzer, Minneapolis: I hesitate to make even a tentative diagnosis, but my impression is that the patient will finally, if he does not now, have mycosis fungoides. He has severe pruritus and inflammatory lesions.

Dr. Isaac R. Pels, Baltimore: I wish to know whether the potassium iodide test was used in this case to determine the possibility of the condition being dermatitis herpetiformis.

Dr. J. Frank Fraser, New York: The condition was tentatively diagnosed as psoriasis, but there is not a feature in the section which suggests psoriasis, so I think that diagnosis can be excluded. With regard to Dr. Sweitzer's suggestion of mycosis fungoides, I can say the same. There is not the slightest evidence of any of the histologic changes usually seen in mycosis fungoides. The chief feature in the section is the edema, both in the epidermis and in the corium. There is so much tendency to vesiculation that I am inclined to place the condition in the pemphigus or erythema multiforme group.

In answer to the question concerning the iodide test: Patch tests, made with a 25 per cent solution, gave negative results. A biospectrometric analysis of the skin was made, and an excess of lead and of nickel was found.

A Case for Diagnosis (Lupus Erythematosus? Lichen Planus Hypertrophicus?). Presented by Dr. J. Gardner Hopkins, New York.

This man, aged 65, shows brown oval plaques from 1 to 3 cm. in diameter, infiltrated and covered with adherent brown scales, on the face and on the bridge of the nose. Huge, soft comedones are visible in some of the lesions. Round plaques on the side of the neck are more superficial, with some evidence of dried exudate. On the back of the right hand is a plaque, 4 by 5 cm., of brown hyperkeratosis without infiltration, on which are four horny, dome-shaped outgrowths studded with deep pits, the largest being 1 by 3 cm. and projecting 9 mm. above the level of the skin.

The general physical examination gave negative results. A roentgenogram of the chest showed an apparently healed tuberculous lesion in the apex of the left lung. There is a possibility of emphysema. A roentgenogram of the teeth showed several areas suggesting apical abscesses.

The Wassermann reaction of the blood was negative. The reaction to the tuberculin test was negative with a 1:10,000 and positive with a 1:1,000 dilution.

Biopsy showed enormous horny plugs dilating the follicular openings. The epidermis was atrophic in some areas and hypertrophic in others, with some branching downgrowth. There were areas of basophilic degeneration of the collagen in the papillary layer and marked infiltration by lymphocytes with numerous plasma cells about the blood vessels and in the glands, extending deep into the corium. Marked thickening and degeneration of the deep blood vessels were evident.

DISCUSSION

Dr. Joseph V. Klauder, Philadelphia: The lesions on the face impress me as being lichen planus atrophicans and those on the hands and arms as lichen planus hypertrophicus.

Dr. Lee McCarthy, Washington, D. C.: I wonder if all the members saw the lesion around the rectum. That, I think, presents the picture of lupus erythematosus.

Dr. Udo J. Wile, Ann Arbor, Mich.: The lesions on the face look like lupus erythematosus, and those on the hand look like tuberculosis verrucosa cutis.

Dr. Richard S. Weiss, St. Louis: I think that the lesions on the back look like lupus erythematosus, those on the neck like sarcoid and those on the back of the hand like tuberculosis verrucosa cutis.

Dr. David L. Satenstein, New York: I have rather a different impression. To me the lesions on the face look like lupus erythematosus in the atrophic stage. Those on the hand are probably epitheliomas developing on senile acanthomas, and those in the perianal region look like dermatitis vegetans developing on skin infected with fungi.

Dr. J. Gardner Hopkins, New York: I have no diagnosis to offer.

Vitiligo Following Arsphenamine Dermatitis. Presented by Dr. A. Benson Cannon, New York.

D. R., a Negro, aged 32, was first admitted to the Vanderbilt Clinic on June 30, 1930, complaining of weakness in the knees and general lassitude. He gave a history of gonorrhea twelve years before, diphtheria ten years before, an operation for appendicitis, a skin disease and a Wassermann reaction of 3 plus, for which he received nine intravenous injections five years before the first admission to the Vanderbilt Clinic. The Wassermann reaction was negative after the injections, but he was syphilophobic and insisted on having antisyphilitic treatment on admission. The physical examination gave essentially negative results except for a slightly enlarged cardiac shadow in the roentgenogram. There was a spot of vitiligo the size of a pea on the chest, and a similar, but slightly larger, patch on the left leg.

After receiving four injections of neoarsphenamine (0.3, 0.45, 0.6 and 0.6 Gm.), from July 30 to September 11, 1930, a rash broke out in the left intracubital region. By September 23 this had developed into a generalized dermatitis. As exfoliation proceeded, the palms and soles became hyperkeratotic and extensive brown and white mottling appeared over the trunk and the extremities. By the time desquamation ceased, there were innumerable snow-white spots, some invading the face and scalp, and all in marked contrast to the dark brown and shoe-black areas.

Since that time the vitiligo of the face had involuted, and small brown spots have appeared here and there in the remaining vitiliginous areas. Repigmentation is still proceeding slowly.

At the height of the cutaneous manifestations the patient had a high amount of arsenic (in the blood, 0.32 mg. per hundred cubic centimeters; in the urine, 0.37 mg. per hundred cubic centimeters, and in the skin, 0.55 mg. per hundred grams of dried specimen). Under medication with sodium thiosulphate, a gradual decrease in the arsenic in the blood and urine, as shown by repeated analysis, roughly paralleled the clearing up of the dermatitis and the initial stages of repigmentation.

Intradermal tests with old arsphenamine, neoarsphenamine and silver arsphenamine gave positive reactions. The Wassermann reaction of the blood remained consistently negative.

A biopsy specimen from a patch of vitiligo showed a complete absence of the formation of pigment under the dopa test, and sections from this and from an additional biopsy specimen treated by the Justus-Brunauer-Osborne method showed granules of arsenic trioxide in both the epidermis and the cutis.

A Case for Diagnosis (Erythema Multiforme?). Presented by Dr. A. Benson Cannon, New York.

This girl, aged 6 years, was admitted to the Vanderbilt Clinic in January 1934, with a generalized eruption of eighteen months' duration. The eruption began as pink swellings, slightly pruritic, which gradually became raised and hard, took on a bluish color and showed a formation of vesicles or bullae. This stage was followed by desquamation, and the hardness subsided slowly, leaving a blue and brown discoloration which persisted for one or two months. There have been two previous attacks, lasting six and ten weeks, respectively. The present attack began five months ago. A generalized macular rash of four days' duration accompanied both this attack and the first one.

There is a history of mumps and vaccination in the fall of 1932. On the patient's admission to the clinic, the general physical examination gave negative results except for hypertrophic tonsils and skin lesions.

Examination of the blood revealed: erythrocytes, 5,300,000, and leukocytes, 10,000, with a differential count of 36 per cent polymorphonuclears, 48 per cent small lymphocytes, 3 per cent large lymphocytes, 1 per cent transitionals, and 12 per cent eosinophils. There were slight achromia and moderate anisocytosis. The urine was normal except for the presence of arsenic (0.107 mg. in a twenty-four hour specimen). The Wassermann reaction of the blood was negative, but the arsenic content of the blood was 0.11 mg. per hundred grams of dried substance, and the hair showed 0.1 mg. of arsenic per hundred grams of dried specimen. An examination for tinea gave negative results. A culture from the vesicles showed a staphylococcus. Roentgenograms of the skull and sinuses gave negative results. Intradermal tests with phenolphthalein gave negative results.

A biopsy showed marked thickening of the blood vessels. There were many eosinophils and some mitotic figures. Polygonal cells were grouped around the blood vessels.

DISCUSSION

Dr. John H. Stokes, Philadelphia: Dr. Ormsby will recall a patient whom he presented last June in Chicago. It seems to me that possibly this patient is starting on the same sort of career, with the erythema multiforme-pemphigus complex. These lesions strongly suggest that, as well as the diagnoses she has had.

Dr. Udo J. Wile, Ann Arbor, Mich.: Has phenolphthalein been excluded? The patient's mother said that in addition to giving castor oil she had given a proprietary preparation of liquid petrolatum, but she could not remember whether it was the form with or without phenolphthalein. Unless phenolphthalein can be definitely excluded as the agent it should be included among the possible causes.

Dr. A. Benson Cannon, New York: When I first saw the girl I, too, thought of phenolphthalein as the most likely cause of the bluish-dusty-slate color of the lesions of the erythema multiforme type. I made skin tests with phenolphthalein and also administered the drug by mouth, with negative results. I

also made sensitization tests with various external irritants as well as with foods, all of which failed to produce a skin reaction. Physically there is nothing abnormal except enlarged and cryptic tonsils. She has slight leukocytosis, and because of the history of the condition's appearing shortly after a severe attack of mumps I thought of the possibility of its being due to an infection producing an erythema multiforme type of lesion. This idea was somewhat strengthened by the appearance of nodules in the scalp that were subcutaneous, hard and apparently attached to the periosteum, but a roentgenogram failed to show any evidence of osseous involvement.

A Case for Diagnosis (Dermatite Lichénoide Purpurique et Pigmentée of Gougerot and Blum, or Schamberg's Progressive Pigmentary Dermatosis?). Presented by Dr. Fred Wise, New York.

Mr. H. F., aged 36, born in Russia, unmarried, first appeared at the dermatologic clinic of the New York Post-Graduate Medical School and Hospital on May 8, complaining of an eruption on the right lower extremity of five months' duration. The eruption first appearing on the inner aspect of the leg, 4 inches (10.1 cm.) above the malleolus, was rusty red, in the form of large spots the size of a pinhead, unaccompanied by subjective symptoms.

Soon after, new lesions of similar character appeared on the anterior surface of the upper part of the leg and also on the anterior aspect of the foot. From one to two months later similar lesions appeared on the shin and below the patella, as well as over the external aspect of the knee and lower portion of the thigh.

The lesions are in groups located chiefly about the ankle and about the knee. The color is rusty red and in some areas there is a secondary yellowish-brown pigmentation. The individual lesions vary in size from that of a so-called cayenne pepper spot, barely visible to the naked eye, to the size of a large pinhead. In some areas, for instance, below the patella, a confluence of these lesions has resulted in the formation of dark red, irregularly shaped, nonelevated plaques. Some of the individual lesions evidently arose in the follicles, others between the follicles. None of the lesions change color under diascopic pressure. The clinical impression is that the lesions are distinctly due to vascular changes.

In some areas a moderate grade of secondary scaling has developed, together with secondary pigmentation. There is no evidence of annular or polycyclic formation, as in Majocchi's disease, nor is there a history of remission or exacerbation or of rheumatic pains. The diagnosis of Majocchi's or of Schamberg's disease was considered. There is a close clinical resemblance to the condition described by Gougerot and Blum (Arch. Dermat. & Syph. **1**:555, 1929), under the title "Dermatite lichénoides purpurique et pigmentée."

The microscopic examination, by Dr. Satenstein, revealed that the entire histologic alteration was one of perivascular cellular infiltration associated with edema of the walls of the vessels. In the subepidermal zone was a bandlike cellular infiltration. In the zone below this and throughout the rest of the cutis was a fairly sharply marginated cellular infiltration about the vessels. The overlying epidermis was thinned. There was some parenchymatous edema of the deeper portion of the cutis. The sweat glands were unaltered. The fat showed evidence of some irritation. The connective tissue of the subepidermal zone was somewhat disorganized, with spaces of various sizes and shapes, the majority of which were empty though a few contained cellular elements. The small blood vessels were moderately dilated, with some swelling of the walls. The lymphatics were dilated, some of the vessels being edematous to the point of occlusion. The cellular infiltrate was somewhat dense—in parts more loosely arranged—and consisted predominantly of small lymphocytes. Some larger connective tissue cells were present. An occasional area in the subepidermal zone of cellular elements contained fine granular pigment as well as some free pigment. In the perivascular cellular infiltration of the midcutis and deep cutis, lymphocytes predominated. The blood vessels were moderately dilated, the walls were edematous, the lining endothelium

was swollen and some of the vessels were occluded. In some of the areas there appeared to be an increase in the number of these small vessels. The vessels of the deep portion of the cutis were more markedly affected; some of them were occluded by proliferation by lining endothelium.

In the fat zone was a proliferation by fat cells. There was no necrosis either of the fixed or of the infiltration elements.

The Perl stain revealed iron.

DISCUSSION

DR. OLIVER S. ORMSBY, Chicago: I have seen only one patient who, I thought, had pigmented purpuric lichenoid dermatitis, and in that case the lesions were more profuse, the papules smaller and the purpuric element less distinct than in this one. If this is a new disease there may be several types, a fact noted with reference to poikiloderma. The original report showed that the condition resembles Schamberg's disease closely. After correspondence with those making the original presentations, Schamberg decided that the disease was different from the subacute inflammatory dermatosis described by him. In the case presented today the lesions are larger and more definitely purpuric than those in the cases originally described, but there is no reason that this case may not be an example of the condition, for it has not been observed in a sufficient number of instances to reveal the possible variations.

DR. HAMILTON MONTGOMERY, Rochester, Minn.: The histopathologic picture shows marked deposits of hemosiderin and a dense inflammatory reaction in the upper part of the cutis. The infiltration is much more marked than I have seen in any case of Schamberg's disease. The histologic picture bears out the fact that the malady is a papular, pigmented, hemorrhagic and purpuric process.

DR. JOHN H. STOKES, Philadelphia: I agree with the diagnosis under which the case is presented—the Gougerot-Blum syndrome, and not Schamberg's disease. Recently I observed a case which fitted perfectly the description of that disorder, and I think that this is another.

DR. KARL G. ZWICK, Cincinnati: It might be of general interest with reference to the mechanical pathogenesis of the lesions of Schamberg's disease and of similar diseases to attempt to determine whether a deviation from the normal elasticity of the walls of the cutaneous blood vessels is a contributory etiologic factor in the development of the present and analogous manifestations. For this purpose I suggest to employ the adaptation or modification of Mosso's cylinder (the so-called plethysmograph) recently developed in Cincinnati. This apparatus is a device for taking oscillometric readings and tracings indicating the local condition of the blood vessels of the extremities.

DERMATITIS VEGETANS. Presented by DR. H. J. F. WALLHAUSER, Newark, N. J.

Mr. W. S., a German, aged 44, has an eruption of ten years' duration. He enjoyed robust health until the condition developed. The case was reported in the ARCHIVES OF DERMATOLOGY AND SYPHILOLOGY (**19**:77 [Jan.] 1929). Two other patients whose cases were reported as showing the same distinctive feature responded to local antiseptic treatment: The condition therefore was considered as of local origin. This patient has failed to respond to any plan of treatment, including the local application of antiseptics, the injection of vaccines, and of various other preparations, roentgenotherapy and the use of bacteriophage. The condition has persisted with a varying degree of intensity until the present time.

The lower lip shows an excoriation the size of a dime that developed with the characteristic grouped pustules, which became crusted, the crusts later peeling off. On the left groin is a moderately elevated lesion with a raised, pustular border. The right foot shows a disappearing lesion that involves about two thirds of the sole and extends to the upper surface of the foot. There is no evidence of an abnormal organic condition.

Cultures of material from the papillomatous areas gave negative results. The pustular lesions showed Staphylococcus aureus; the oral lesions showed a pure streptococcus. Examination of the tissue, by Dr. Highman, revealed infectious granuloma, probably due to the presence of fungus.

There is a clinical distinction between the onset of the recurrences in this case and that in the other two, for beginning in the affected areas, groups of pustules the size of a pinhead develop into exuding circular or serpiginous lesions which advanced at the border with the characteristic pustulation. Gradually papillomatous elevations develop. From experience with such cases, I consider dermatitis vegetans not as a clinical entity, but rather as a secondary manifestation of varied etiology, and in this case a tentative diagnosis of impetigo herpetiformis as the primary factor is suggested.

DISCUSSION

Dr. Oliver S. Ormsby, Chicago: I am not able to make a diagnosis, but I wish to make one suggestion. According to the history, the disease has been progressing for years, and it would be extraordinary for a simple pyogenic dermatitis to continue over a period of years in spite of varied treatment. There is one condition now believed to be infectious that has this history, namely, acrodermatitis continué, but this occurs chiefly on the hands. The lesion on the toes and foot in this case suggests this disease, and there is a possibility that the condition is acrodermatitis continué. This is only a tentative suggestion.

Serpiginous Ulcerating Pyodermia (Pyodermia Gangraenosa). Presented by Dr. Howard Fox and Dr. E. R. Maloney, New York.

This woman, aged 70, born in Sweden, presented from the ward service of Bellevue Hospital, is suffering from an eruption of two and a half years' duration. She emigrated to the United States forty-two years ago and before the appearance of the eruption was in excellent health. She is a widow and the mother of two grown daughters, both in good health. The eruption consists of extensive ulcerations of the right thigh, with exuberant granulations which bleed easily on trauma and have a copious seropurulent discharge. The borders are sharply demarcated and serpiginous. At one time there were gangrenous sloughs in some parts of the advancing border. The diseased area has healed completely at times with superficial scarring, but the lesions have recurred. The clinical appearance has changed greatly at different periods. There are no superficial varicose veins and no swelling of the leg. The Wassermann reaction has repeatedly been negative. The examination of the blood revealed nothing unusual except leukocytosis on several occasions. The urine is normal.

A histologic examination of the advancing border revealed simple inflammation. Various gram-negative cocci and bacilli were found in smears. No blastomycetes were seen either in cultures or in smears. An examination of the stool revealed no monilia, no ova of parasites and no blood. The case will be fully reported later.

DISCUSSION

Dr. Joseph J. Eller, New York: I should like to suggest the possibility of involvement of the nerve supply to the lower limbs and of a lesion of the spinal cord, with the eruption secondary to degeneration of the skin.

Dr. Karl G. Zwick, Cincinnati: The appearance of the extensive lesions reminds me of two cases of progressive cutaneous necrosis which for a long time resisted many forms of treatment. In both cases bacteriologic investigation revealed the presence of a symbiotic double infection, one of the bacteria being a preferentially (i. e., not obligatory) anaerobic bacillus (Bacillus necrophorus?). The condition in each patient responded slowly to injections of a mixed autogenous vaccine combined with local applications and irrigations of oxygen-liberating solutions of potassium permanganate, sodium perborate and hydrogen dioxide. Recently, the surgical literature has contained reports of analogous observations, which prompted my therapeutic procedure.

Dr. E. William Abramowitz, New York: I agree with Dr. Zwick. I have been interested in the subject of pyodermia gangraenosa because I have had two such cases. One patient, with symptoms of ulcerative colitis, made a complete recovery as far as the skin lesions were concerned when given a diet high in vitamins. In the case of another patient repeated transfusions of blood seemed to be of benefit. It has been demonstrated that the condition is due to the symbiotic action of the staphylococcus and streptococcus, which seem to be able to cause extensive destruction of the tissue in a patient weakened by a long continued chronic infection.

Dd. Howard Fox, New York: We gave this condition a rather long name which was merely one of a half-dozen names that have been used to describe the malady. Possibly "pyodermia gangraenosa" sounds out of place because there is no gangrene, but some cases show gangrene, and at one time there were some gangrenous sloughs of the lesions in this case. Practically all the laboratory examinations have given negative results. I am glad that no one suggested the possibility of a self-inflicted condition, as has been previously done. The personality of this patient makes such an idea improbable. She has been under close observation by nurses for a long time, and I feel sure that a factitious element can be excluded.

Moniliasis. Presented by Dr. J. Gardner Hopkins, New York.

This girl, aged 9 years, has an eruption which began at 18 months of age on the scalp. It has been persistent in the ears and in the axillae and at times has almost completely covered the body.

She shows alopecia, perlèche, crusted lesions in the nares and the canals of the ears, and intertrigo of the ears, the axillae, the gluteal regions and the groins. On the back are irregular plaques of erythema with fine branny desquamation and, in certain areas, loss of the surface epithelium and huge, adherent crusts. There are similar crusts on the scalp and elsewhere.

Cultures of material from the scalp, tongue, ear, neck and stool showed Monilia albicans.

Skin tests with an extract of M. albicans produced a faint scaling dermatitis in seven days.

Moniliasis. Presented by Dr. J. Gardner Hopkins, New York.

This patient was previously presented, and his case was reported in the Archives of Dermatology and Syphilology (**25**:599 [April] 1932).

A boy, aged 11, has had a severe and persistent dermatosis since the age of 11 months. It began on the face and scalp, and at the same time he had white patches on the tongue. At the age of 5 there developed inflammation of the fingers, with paronychia and intertrigo of the fingers, toes, armpits, groins and flexures of the elbow. At times there has been almost complete loss of hair.

Cultures of the stool persistently showed a profuse growth of Monilia albicans, and the same fungus was isolated from lesions about the mouth. An injection of an extract of M. albicans into the forearm produced a persistent, extending lesion simulating those which occurred spontaneously.

The condition is now much improved. The circumoral dermatitis is barely visible, perlèche is marked and onychia is slight. A patch of dermatitis typical of the earlier lesions is still present on the front of the ankle.

DISCUSSION

Dr. Lloyd W. Ketron, Baltimore: I wish to ask Dr. Hopkins if the diagnosis in these cases is made because of positive skin reactions and whether one can say that the disease is due to Monilia because the organism is recovered from the lesions.

DR. J. GARDNER HOPKINS, New York: Dr. Ketron's question is to the point. I am only sure in the case of the boy, who is now greatly improved. In that instance the injection of the early preparations of Monilia into the arm not only elicited a reaction but caused progressive lesions which could not be distinguished from spontaneous lesions, and control extracts caused no reaction. Today that type of reaction is not obtainable; there is a reaction, but not of the same kind. I have seen a number of patients who are profuse and persistent carriers of Monilia. The last cultures taken showed Monilia present in the mouth and in the stools in profusion. Cultures taken last week from the skin of both patients were negative. When the girl had a cutaneous eruption Monilia was obtained from all the lesions. That is not proof, but it is a mark of identification that puts the conditions of these patients in a group, and I may be able to prove later that Monilia is responsible.

UNILATERAL ACRODERMATITIS CHRONICA ATROPHICANS (ASSOCIATED WITH PSORIASIS). Presented by DR. FRED WISE and DR. IRVING S. WRIGHT, New York.

Miss T. M., Finnish, aged 31, unmarried, first noticed swelling and redness of the right upper extremity about three years ago. The condition started on her hand and gradually spread to involve the forearm and then the upper part of the arm. No subjective symptoms have accompanied the condition, though attention is attracted by the difference in the appearance of the two extremities.

The right upper extremity shows a diffuse reddish-blue color, most marked on the dorsum of the hand, but extending to the forearm and, to a less degree, to the upper part of the arm. The skin of the dorsum of the hand is definitely thinner and is wrinkled and atrophic; that of the arm is less markedly changed. There is definite swelling of the involved extremity; the circumference of the wrist and of the region of the elbow is greater by 2 cm. on the right than on the left. The temperature on the surface of the right hand and forearm is in some areas 4 F. higher than that of the left. The blood pressure is 124 systolic and 72 diastolic on the right and 120 systolic and 72 diastolic on the left.

A capillaroscopic examination of the right hand revealed a normal number of capillaries per field, moderately dilated, with a fairly rapid rate of flow. The degree of tortuosity was normal. The capillaries of the left hand were normal in size and had a normal flow. These observations, according to the technician, are suggestive of a circulatory anomaly, the most likely being an arteriovenous aneurysm. An attempt to secure an arteriogram did not meet with success, but the procedure is to be repeated.

The possibility of a cervical rib as a causative factor was considered, but roentgenographic examination revealed a normal thorax.

The patient has concomitant psoriasis of fifteen years' duration, which has no bearing on the condition for which she is presented. There is absence of pulsation of the lower portion of the ulnar artery.

DISCUSSION

DR. OLIVER S. ORMSBY, Chicago: It is interesting to see a patient with this condition. I have seen two cases in which the disease was limited to one leg. Fordyce reported such a case, in which there was underlying syphilis. The clinical picture here is that of acrodermatitis chronica atrophicans.

DR. FRED WISE, New York: The interesting feature is not so much that the disorder is unilateral acrodermatitis chronica atrophicans but that Dr. Wright, who works with the capillaroscope daily at the New York Post-Graduate Medical School and Hospital, believes that the change in the woman's arm is due to anastomosis of the brachial veins and arteries. In view of the reports in the literature of from ten to fifteen cases of unilateral acrodermatitis occurring independently of arteriovenous aneurysm, it seems doubtful that such a vascular anomaly will be demonstrable in my patient.

ACANTHOSIS NIGRICANS. Presented by DR. HANS J. SCHWARTZ, New York.

Mrs. A. DeG., aged 47, presents a disorder of four years' duration which is generalized but involves especially the flexures and the feet. She states that "itching growths" on the skin and "growths" in the mouth appeared during 1930. She was admitted to New York Hospital in October 1932, and since then has been under close observation. During the first two years the cutaneous condition progressed considerably on the feet but was practically stationary elsewhere. In November 1933 palpation disclosed a mass in the abdomen which since then has increased in size. The general health has been good throughout the period of observation; she has lost 9 pounds (4.1 Kg.).

At present an acanthotic process is well shown on the feet, in the axillae and in the groin. The abdomen is occupied by a hard mass which moves with respiration and has a well defined lower edge; it is tender in some areas, especially in the hypochondrium on the left.

Roentgenographic examination revealed the skull, heart, lungs and gastrointestinal tract, including the rectum, to be normal.

The condition has not been influenced by any therapy, including the administration of extract of the suprarenal cortex.

An extensive laboratory examination was made. The normal values for the plasma chlorides and the blood pressure and the normal reaction to the Goetsch skin test showed the suprarenal glands to be functioning normally. The pituitary gland was normal as evidenced by a normal amount of anterior pituitary-like substance in the urine and an absence of alteration in the visual fields. A normal creatine metabolism and a normal basal metabolic rate showed the thyroid function to be normal, and the pancreas showed normal function indicated by the reaction to the dextrose tolerance test. The urine showed no tyrosine or melanin, and the fractional gastric analysis revealed no free acid before and after the injection of histamine.

DISCUSSION

DR. HAMILTON MONTGOMERY, Rochester, Minn.: I wish to emphasize that in the experience of myself and my associates at the Mayo Clinic with acanthosis nigricans occurring in adults, in the majority of cases there is an underlying malignant process involving the chromaffin system. In three cases, in spite of negative results of clinical and laboratory studies for evidence of an abdominal malignant process, we felt justified in performing an exploratory laparotomy. In each case the surgeon was unable to demonstrate a lesion, yet each patient died in from a few months to a year afterward with definite clinical evidence of malignant involvement of the liver and other abdominal organs.

LUPUS MILIARIS DISSEMINATUS FACIEI? Presented by DR. HOWARD FOX and DR. E. R. MALONEY, New York.

S. M., a Puerto Rican Negro, aged 39, a blacksmith, presented from the New York University Clinic, is suffering from an eruption of the face of two and one-half months' duration. The patient has been in the United States during the past fifteen years. He gives no family or personal history of tuberculosis or syphilis. The eruption consists of numerous smooth, firm, nonpruritic, flesh-colored nodules ranging in size from those of a pinhead to that of a pea, scattered over the face. The reactions to the Wassermann and Kahn tests were negative. A roentgenogram of the chest revealed nothing abnormal.

DISCUSSION

DR. FRED WISE, New York: Since the diagnosis is presented with a question mark, I wish to subscribe to the diagnosis of lupus disseminatus. I have observed numerous Negro patients in New York with lesions at the mucocutaneous junctions of the eyelids and the nares which so closely simulate the eruption in this case that I should say the possibilities are much more in favor of that diagnosis than of any other condition.

FLAT PAPULAR SYPHILID WITH UNUSUAL COALESCENCE. Presented by DR. HOWARD FOX and DR. E. R. MALONEY, New York.

J. V., a Puerto Rican man, aged 22, from the New York University Clinic, has suffered from a sparse generalized eruption for two months. It involved the face, the left palm and the legs. There is a history of a penile lesion four months prior to the appearance of the eruption, and the reaction to the Kahn test is strongly positive. The peculiar clinical feature is the marked coalescence of flat papules the color of lean ham on the face, forming a diffuse area on the lips, chin and adjacent parts of the cheeks.

GRANULOMA ANNULARE WITH UNUSUAL FEATURES. Presented by DR. PAUL E. BECHET, New York.

This man, aged 35, states that for one and a half years he has had an eruption on the back of the hands. The nodules are characteristic but of unusual distribution. The ringed or circinate arrangement is much less noticeable than is usually the case. Many of the lesions are isolated and do not form rings. Beneath a normal epidermis are islands of infiltration, in the center of which is an area of collagen fibers that show granular degeneration on necrosis. The fibers that persist show basophilic degeneration. The cellular exudate consists of lymphocytes and rather large pale-staining cells that may have originated in the connective tissue or may be endothelial cells. A tuberculin test was positive with a dilution of 1 : 100,000.

DISCUSSION

DR. FRED D. WEIDMAN, Philadelphia: This is another case in which I thought of the possibility of rheumatism. The lesions may be rheumatic nodules, particularly in view of Dr. Michael's paper which he read at the meeting last year, in which he emphasized that one must not think that granuloma annulare is invariably associated with tuberculosis. Examination for focal infection, including rheumatism, might help in diagnosing the condition.

MULTIPLE DISSEMINATE PIGMENTED NEVI. Presented by DR. PAUL E. BECHET, New York.

This girl, aged 11 years, had at birth an exceedingly hairy pigmented mole about 7 mm. in diameter, covering the upper part of the right side of the face. When the child was 2 years old the mole was excised. The mother could not definitely remember whether there were any other lesions at the time, but she believes that there were. A photograph taken at the time shows none. At the age of five there were many new lesions over the face, and the nevoid growths rapidly increased in number until the entire body was covered.

The child presents hundreds of pigmented nevi of various sizes all over the body. Even the palms have not escaped. Some of the lesions are black and indurated. The question of a possible sarcomatous change must be considered, yet the child has had the growths for nine years without any effect on her health, though they continue to increase rapidly in number.

A biopsy showed many nevoid cells but not malignant changes.

DISCUSSION

DR. ROBERT C. JAMIESON, Detroit: I saw this girl when she was 2 months old. At that time there was no evidence of nevi, except a pigmented hairy nevus on the right eyebrow in the temporal region. It was excised some time after that by a plastic surgeon in Detroit, and I think that he will be surprised to learn that these multiple pigmented lesions have developed which I presume were unrecognized at the time of operation.

DR. RICHARD S. WEISS, St. Louis: I do not think that one can consider these moles as evidence of a malignant process. It has been observed in children as

well as in adults that following an infectious disease a shower of moles appears. Strange to say, the reverse also is seen: a person with a number of light and dark brown moles scattered over the body will suddenly lose the moles after a febrile attack. I certainly do not think that this patient shows evidence of a malignant process.

Dr. David L. Satenstein, New York: A malignant condition with metastases resulting from nevi is usually carcinomatous. The history is usually short; the condition rarely lasts more than a number of months and certainly not more than a year or two, never extending over a period of six or seven years. I have never seen a nevocarcinoma develop in, or subsequent to the removal of, a hairy nevus.

Dr. Paul E. Bechet, New York: During the year that the child has been under my observation many new lesions have appeared. Many of the lesions are dark, nearly blue-back. Some are raised and nodular; others are frankly the visual type of hairy pigmented moles. The point of the presentation, besides the extraordinary number of the lesions, is to consider the possibility of the future development of a malignant process, despite the fact that the lesions have been present for many years and the child is still perfectly well.

NEW YORK ACADEMY OF MEDICINE, SECTION OF NEUROLOGY AND PSYCHIATRY AND SECTION OF DERMATOLOGY AND SYPHILIS

C. Burns Craig, M.D., *Secretary, Section of Neurology and Psychiatry*

Eugene F. Traub, M.D., *Secretary, Section of Dermatology and Syphilis*

Joint Meeting, April 10, 1934

Clarence P. Oberndorf, M.D., *Chairman, Section of Neurology and Psychiatry*

Leo Spiegel, M.D., *Chairman, Section of Dermatology and Syphilis*

Introductory Remarks. Presented by Dr. Clarence P. Oberndorf.

When the Chairman of the Section of Dermatology and Syphilology approached me last year with the idea of having a joint meeting of the Section of Dermatology and the Section of Neurology and Psychiatry, it did not take us long to decide that the greater interest to the majority of the members would be not in the organic manifestations of diseases of the skin resulting from lesions of the spinal cord and of the nerves, such as the trophoneuroses, but in those conditions in which the psyche seems to play an important rôle in producing changes in the skin. Of course, in popular language there are terms which refer to the relation between the psyche and the skin, such as "thick-skinned" or "thin-skinned," the well known "itching palm," and so on. One of my patients once said that she must have absorbed everything she knew through her skin because she never actually thought in her life. This brings us to the thought of whether one really thinks through the brain alone.

In some situations the psyche seems to play an important rôle in the production of pathologic conditions of the skin, such as excoriations of one kind or another caused by self-punishment. Then there are mental conditions in which an irritation of the tongue develops as a result of a habit of trying to bite off the tongue which offends himself or his relatives. A clear connection between the skin and the mind is shown in herpes zoster following a marked psychic shock. Again, there is the field of allergy, where it is beginning to be recognized that certain types of dermatologic manifestations are caused not only by toxins but by

psychic reactions. This evening I think the field of allergy will be entered somewhere between the purely pathologic eruptions of the skin and the psychic reactions. It is indeed a pleasure to have as the guest of the evening Dr. Joseph Klauder of Philadelphia, who will speak on "The Psychogenic Aspects of Diseases of the Skin" from the dermatologic standpoint.

PSYCHOGENIC ASPECTS OF DISEASES OF THE SKIN. Presented by DR. JOSEPH V. KLAUDER, Philadelphia.

In describing the psychogenic aspects of diseases of the skin the following phases must be considered: the influence of the skin on the psyche, the influence of the psyche on the skin and the clinical aspects of the relation of the psychologic phenomena to diseases of the skin.

The Influence of the Skin on the Psyche.—One is more conscious of the skin than of any other organ. It occupies an important place in the consciousness, not alone as an abstract idea, but because it is the site of many sensations. Frequently an insignificant blemish, mild acne, a few superfluous hairs or, indeed, any mild abnormality of the skin produces a psychic reaction; it decreases the self-respect of the patient and produces a feeling of inferiority, of abnormality or of uncleanliness that is difficult to overcome.

The basis of the psychic reactions which cause a sense of inferiority, of abnormality or of uncleanliness must be considered. Any striking deviation from the normal in the face or the form is likely to influence one's fate. The fear and the dread of disfigurement are innate in mankind. That this was true in biblical times may be surmised from the admonition in the third book of Moses, which forbids one who has a blemish or is lame, deformed or blind to enter the temple to offer the bread of his God.

The conception of a connection between bodily beauty and psychic perfection is apparent in the history of the beginning of the science of psychognomics. The influence of the decoration of the skin and of the adornment of the human body and the influence of clothes on the ego are of great significance and may be correlated with the influence of the appearance of the skin on the consciousness and with the effect of cutaneous involvement on the ego.

The Influence of the Psyche on the Skin.—The psyche exerts a greater influence on the skin than on any other organ. This influence is apparent in the many cutaneous expressions of the emotions. The skin is an important organ of expression, comparable only to the eye.

Suggestion in hypnosis can produce such cutaneous lesions as erythema, vesicles, bullae, lesions resembling burns, ecchymosis and bloody exudate from a previous dermatographism. Sympathetic pain and cutaneous lesions have been reported as occurring immediately following the sight of suffering or accident, for instance, the production of an ecchymosis as a result of seeing a friend bleed.

The physiology of the skin is intimately related to the sympathetic nervous system, the endocrine glands, the emotional state of the subject and the calcium-potassium ratio in the skin. The irritability of the skin is apparently determined by the calcium-potassium ratio in the skin, which in turn is interrelated with the sympathetic nervous system, the endocrine glands and the emotional state.

The peculiar lability of the vasomotor apparatus in psychoneurotic patients, as manifest in disorders of the peripheral circulation, is important in a consideration of the psychogenic factors in diseases of the skin. The spontaneous occurrence of ecchymosis is not uncommon in hysterical persons.

In the following diseases of the skin, psychologic phenomena either play a motivating rôle or are a notable determining factor:

Blushing Pallor Cutis anserina Horripilation Changes in secretion of sweat	motivated by the emotions

(Dermatographia) → angioneurosis → erythematous eczema → angioneurotic edema → acute eczema (acute dermatitis)
Urticaria, acute or chronic
Edema (angioneurotic edema, edema in hysterics)
Pruritus, localized or generalized
Phobias referable to the skin
Neurotic excoriations: dermatothlasia (Fournier), self-produced lesions (no deception intended; variable psychogenesis)
Dermatitis factitia (mythomania of Dupré—self-produced lesions for deception
Fixed pain and sensory disturbances (topalgias of Blocq, for example, "burning tongue")
Angiospasm (so-called "dead" fingers)
Sudden loss of hair (alopecia areata) or a sudden turning to white (canities)
Trichotillomania
Trichokryptomania
Stigmas of the crucifixion
Tattoo
Psychogenically produced manifestations in the allergic state

Hysterical gangrene, bullous lesions (so-called pemphigus hystericus) and dermatitis dysmenorrhoeica are not included since there is much evidence that these disorders are self-produced. Herpes zoster and psoriasis do not have a psychogenic basis, but there is a psychogenic factor in the pathogenesis of dermatitis herpetiformis of lichen planus and of the localized form of neurodermatitis.

Erythema of psychogenic or angioneurotic origin, which commonly involves the face, may spread and involve the greater part of the cutaneous surface, virtually becoming erythematous eczema. In this event, it is usually blotchy and has sharply marginated borders. Dermatographia is a common circulatory disturbance of psychoneurotic patients. Localized edema and urticaria, as is well known, may appear suddenly after a psychic disturbance. A close relationship exists among dermatographia, angioneurotic edema, urticaria and dermatitis or acute eczema. These cutaneous reactions manifest additional steps in the same mechanism, which involves an unstable action of the sympathetic nerves, a vasomotor instability and an increased permeability of the cutaneous vessels of the neurotic patient. These cutaneous disorders which appear suddenly after a psychic disturbance, especially in psychoneurotic patients, may be justly designated as psychogenic.

Pruritus may appear at the site of the psychic fixation, the location of the itching frequently manifesting the influence of events, recollections or conceptions. Suggestion and autosuggestion may play a part in the causation of itching. The desire to scratch is contagious, and psychic expression alone may suffice to initiate the sensation of itching. The sexual and lustful element in itching has been overemphasized. A considerable percentage of all patients with pruritus, especially those with pruritus vulvae and pruritus ani, are psychoneurotic and other symptoms of psychoneurosis are present.

Neurotic excoriations have a variable psychogenesis. This disorder may be an expression of a phobia (usually the fear of parasites), an expression of a tic or a phenomenon of displacement. Other instances may be classified as topalgia of Blocq or as Janet's obsession of shame of the body. In pronounced cases of neurotic excoriations, the psychogenesis is not easily determined and the cure is not easily effected.

The psychogenesis of dermatitis factitia concerns the rôle that suggestion plays in the causation of the self-produced lesions. Menninger claims that dermatitis factitia represents a localized self-destruction which serves simultaneously as an externally directed aggression of deceit, robbery and false appeal.

If one accepts the validity of reported instances of a variety of cutaneous lesions produced by suggestion in hypnosis, one can envision the stigmas of the crucifixion as cutaneous phenomena which are not beyond the realm of pathologic possibility. The tremendous nature of the mental stimulus which precedes the appearance of these stigmas and the emotional background of the subjects on whom they appear are of importance in the psychogenesis. The limitations of the influence of the mind over the body are still unknown.

In a study of the diseases of the skin in which psychic influences may play a rôle, the history is important in furnishing a clue as to psychogenic etiology. The type of patient and his emotional make-up are of importance in evaluating psychic influences. Attention should be focused on the circumstances associated with the onset and with the continuation of the pathologic condition, its occurrence after a certain act and its specificity referable to the time and place of its occurrence. Cutaneous phenomena characterized by vascular dilatation (erythema and exudation) which appear and disappear suddenly are suggestive of a psychic or an allergic causation.

PSYCHOPHYSIOLOGY OF THE SKIN. Presented by DR. PAUL SCHILDER.

Neither tactile nor optic sensations give one a definite impression concerning the skin. Knowledge of it is acquired by a continued dynamic process. Since the real and the imagined worlds are fundamentally the same, mental processes and emotions lead to sensations in the skin which are equivalent to perceptions. Furthermore, these sensations are connected with actual changes in the physiology of the skin. Emotional processes may lead also to organic changes in the skin. The basis for the conversion of symptoms to the skin is often some past organic disease, especially a disease of childhood. The diseases of the skin of one person may facilitate the production of symptoms of conversion in another person with whom he is in libidinous contact. Finally, the entire life history both past and present, is of importance.

One case of psychogenic itching may be based on previous itching due to pubic lice, while another case of psychogenic anal itching may be associated with a secretion. Fear of castration, anal libido and organic changes experienced in early childhood also may be responsible.

Imagination may provoke sensations in the skin which have a definite meaning. The conscious wish may become sufficient, but generally the unconscious wish has the greater power. Spontaneous hemorrhages, blisters on the skin or urticaria may be the result of such unconscious attitudes. The changes in the skin are never isolated, but are merely the foreground of a total experience, the background of which is formed by the organic and psychologic past of the organism. The expression of the general psychosomatic change caused by emotions is dependent on the psychic attitude toward the different parts of the body in general, and especially toward the skin. The final formation of the psychosomatic change depends also on the outward world. Infectious herpes labialis can be provoked by hypnosis. It is probable that various psychogenic dermatologic manifestations are due to specific conflicts in early life. There exists a differential psychology of the various psychogenic conditions of the skin. Anal itching has a close relationship to sadomasochistic tendencies. Psychogenic blushing is in close relationship to narcissistic attitudes and to the leveling of love to include others. Blisters and hemorrhages on the skin are closely related to a hysteriform attitude with a strong infantile Oedipus conflict. Changes in the skin that are due to organic diseases provoke a definite set of psychologic attitudes. Only by a complicated psychic process which goes through various psychologic layers does the patient become aware of these organic changes. The self-perception of an organic lesion of the skin goes through various symbolic stages by which it is brought into connection with the total experiences of the subject. Self-perception of the skin is a highly symbolic act.

A psychogenic manifestation in the skin always has a meaning; it may be conscious or it may lie in the sphere of symbolism or of instinct. There is no fundamental difference between imagined changes, so-called psychogenic manifestations, and organic lesions of the skin. They are all centrifugal, emanating from central conflicts of the personality to the periphery. Emotions and imaginations are never merely psychic, for the psyche is an organic agent. Neither does an organic disease of the skin remain at the periphery; it goes to the very center of the personality. Processes that are purely organic do not exist, for the organism is fundamentally a psychophysical entity.

DISCUSSION

DR. ABRAHAM WALZER: It has been a pleasure to listen to the speakers this evening, and I congratulate them on their masterful presentation of a rather difficult subject. Dr. Klauder was probably the first dermatologist in this country, or at least one of the first (and I think he deserves credit for that), to publish original observations on the question under discussion tonight—on the part played by the vegetative nervous system as the mechanism, and the calcium-potassium ratio of the skin and the blood as chemical factors, in the production of certain types of diseases of the skin.

With a subject of such vast magnitude and with time so limited, it may be advisable for me to discuss a type of the diseases mentioned tonight and analyze the symptoms in the direction of the possible mechanism of their production. How are the symptoms produced, and what is the relation to the psychogenic factors with which they are supposed to be connected? One of the best examples of these diseases is chronic or recurring urticaria. Whether the urticaria is toxic, allergic, psychogenic or otherwise, the symptoms are alike. Stokes has aptly labeled the wheals "cutaneous tears," but shed by the physician as well as by the patient, because there is no condition that so taxes the mind and ingenuity of the physician as do these chronic or recurring urticarias.

Now, how are the wheals produced? Experimentally one is able to produce wheals by a number of different methods and to study their various phases. Wheals can be produced by the intradermal injection of certain drugs, such as codeine and morphine, by cold, by heat, by traumatism in a susceptible person and by the intradermal injection of serum from an allergic subject into the skin of a normal subject, followed by the injection of the corresponding antigen at the same site. Wheals can also be produced experimentally through the gastro-intestinal tract by the injection of the serum of certain food-allergic persons into the skin of another. Then, when this person is fed the specific offending food the wheal will develop at the site of injection. While these variously produced wheals are indistinguishable clinically and histologically, each wheal undoubtedly went through a different mechanism in its formation. But they all had one important factor in common; namely, they all induced the liberation of histamine or a histamine-like substance as the end-result of their mechanism, and this substance, acting *directly* on the capillary vessels caused an increased permeability with the production of the resulting wheals. They are therefore independent of any nervous influence for their formation. Furthermore, the production of a wheal is not a simple angioneurosis, nor is it a simple angiospasm with a simple stretching of the capillary walls and oozing of the serum. It is a chemical reaction which induces the liberation of histamine or a histamine-like substance.

As to the mechanism of the wheal in so-called psychogenic urticaria, certain writers have suggested that in such urticaria the wheals are the result of one of two mechanisms: (1) The vegetative impulse attacks the digestive organs, with consequent digestive changes which influence the blood and then the skin—hence the wheal; (2) the vegetative impulse attacks the skin directly, with liberation of histamine or a histamine-like substance. Both of these conjectures appear to be purely hypothetical, and more than theory is needed for a final proof. It has never been established that histamine or a like substance is liberated as a result of nervous stimulation. While it is known that certain chemical changes take place in a nerve as a result of an impulse, no one has satisfactorily shown that a nerve so stimulated liberates histamine or a histamine-like substance at any of its points of contact. Therefore great care must be taken before it is assumed that, because a wheal is present which is unexplainable by any other means, histamine or a histamine-like substance necessary for its formation was liberated by psychogenic stimulation alone. Another factor, probably just as important or more so, is necessary in such cases in addition to the neurogenic stimulus before histamine is liberated, that factor is a certain type of skin. In other words, the psychogenic factor merely acts as a precipitating cause in a specially prepared site: an atopic shock organ—the skin. I shall refer to this again shortly.

One of the proofs advanced as to the causation of psychogenic wheals has been the results of therapy; i. e., the psychogenic causation of these wheals has been proved by their successful psychogenic treatment. The fact that a patient responds to psychotherapy is not an altogether satisfactory or sufficient proof that a condition of psychogenic causation has been treated. Credit for a satisfactory therapeutic result must be given to such factors as the patient's natural capacity for recovery, local therapy, rest, changes in climate, etc., and also to the fact that such good results are not often reported in many similar cases.

Dr. Schilder has touched on and elaborated beautifully the question of the multiplicity of causes of disease. I should like to emphasize that in a little different way. In attempting to treat disease, the physician often begins with a preconceived idea of one cause. In a search for the etiology, having found one cause that may or may not be important, he thinks that he is through and attributes all of the symptoms to it. In other words, every effect or disease has its single cause. It is now more or less agreed that disease is essentially the interaction of a soil (a complex human organism) and the seed (the offending factor). In both of these (the soil and the seed) reactions and changes are constantly taking place, and as a result of this union, each of these changes may produce its own symptoms. The effect of such a mechanism, that is, the interaction of the soil with its changes and the seed with its changes, is what is recognized as the symptom complex of the disease. What seems to be a single cause of a multiplicity of symptoms is in reality a multiplicity of causes producing the various symptoms. So with the psychogenic urticarias; while the psychogenic factors are unquestionably important, they are not the whole cause of the effect, not the whole seed, but only one link in the etiologic chain.

Summarizing the whole problem of urticaria, the probable mechanism of this type of disease is as follows: Many of the so-called psychogenic urticarias are in reality nonspecific reactions to a psychogenic stimulus in an atopic subject. Many of the patients are atopic. They give personal or family histories of such atopic diseases as asthma, urticaria, hay fever, etc. They have inherited an organ (the skin) which is sensitive to shock and as a result of a psychogenic stimulus the skin responds with urticaria. They may have other shock organs, such as the mucous membranes of the bronchi and nose, and as a result of similar stimuli may have symptoms referable to those, such as asthma. Experimentally one is able to produce such a phenomenon. For example, if the serum of a person who is sensitive to egg is injected into the skin of a normal subject and the next day the subject is fed an egg, a wheal will appear within a few minutes at the injected site. In half an hour or so the wheal will be gone. If the site of the injection is traumatized the next morning the wheal frequently recurs at the site of the previous wheal. That is not a dermatographic wheal because wheals cannot be produced at any other site in that person; nor is it strictly speaking an egg wheal because it was not produced by the ingestion of egg. In other words, this specific site on the skin, or the shock organ, is in a receptive mood and, following various types of stimulation, a wheal may be produced. It is not a specific wheal because it was not reproduced by the original cause but by a nonspecific cause, such as trauma. This can be compared to the case of a hypersensitive person who has asthma due to ragweed which occurs during a certain part of the summer. If he catches a cold during the winter it may be followed by an attack of asthma. Or that same person during the winter, after a severe mental or physical shock, may have an attack of asthma. It is not a cold or neurogenic asthma; it is simply a nonspecific reaction in an organ (the bronchial mucous membrane) which is in a receptive mood and waiting to be teased along to produce a reaction.

I believe that the so-called psychogenic urticarias are not psychogenic in the true sense, but nonspecific reactions induced by nonspecific factors in an atopic subject. For this reason, treatment of the precipitating factor often clears up the attack.

In conclusion I wish to emphasize one fact. In searching for the etiology in these types of diseases, one should include all of the neurologic findings but be

cautious in concluding that the cutaneous disease is necessarily neurogenic. On the other hand, the treatment of the neurogenic or other precipitating factors may be important and may be of aid in clearing up the attack. In other words, the usefulness of certain therapeutic measures may be more important than the truthfulness of a certain theory of the causation.

DR. E. D. FRIEDMAN: Since all modern thinking is colored somewhat by the new psychologic approach to man, it is perhaps logical that dermatology should also have come under the spell of the psychologic point of view. I have listened with great interest to these papers, and it must be admitted, even if one differs somewhat from the point of view of one of the speakers, that one has been instructed and entertained.

I think that I must disagree definitely with Dr. Klauder, if I understand him correctly, in his attempt to make herpes zoster a psychogenic disease. It is known that a definite pathologic process underlies this disease, namely, an infectious ganglionitis. It is as logical to say that herpes zoster is a psychologic disease as to say that because simple herpes sometimes appears following injections of typhoid vaccine or after radiothermy, these agents caused the herpes. Both of these procedures simply activate the virus which is the ultimate cause of the herpes.

I should also like to hear some reasons for designating many cases of itching as of psychogenic origin. I assume that organic factors have been excluded. Perhaps Dr. Klauder in the detailed presentation of his cases has already produced the facts. I should like to know, for example, whether a careful study of the blood sugar and the basal metabolic rate was made and whether studies were carried out to exclude latent diabetes, hyperthyroidism or leukemia. In the case of the so-called hysterical ecchymoses, one would have to exclude thrombocytopenic purpura.

It is agreed that the involuntary nervous system plays an important rôle in many clinical entities. Vagotonia and sympathicotonia certainly are clinical concepts, but one must hesitate to ascribe to them direct and exclusive etiologic significance.

During the war the condition known as "main gelée" appeared as a result of injuries and was called "hysterical hand." Later it was found, however, that many of the cases were the result of injuries of the median nerve with typical causalgia, as described by Weir Mitchell years ago. The malady was an organic neurologic entity and not a psychogenic syndrome. Jackson in his textbook of dermatology, which was used in my student days, said in the chapter on warts; "It is strange that they often disappear and no one has seen them fall." I have been told that some dermatologists have postulated cures of warts with psychoanalytic methods. In such cases I should say that the cure was a *post hoc* and not a *propter hoc* phenomenon. And so I should state that while psychogenic factors exist in all forms of human illness, I for one am not willing to accept the dictum that they can serve as sole etiologic factors in diseases accompanied by the type of organic manifestations discussed this evening.

I am certain that one must agree with Dr. Schilder in his emphasis on the approach to illness through a study of the total personality. There is no question but that the study of man is necessary in every field of medical science. It is necessary in neurology, in dermatology and in internal medicine. The background (milieu) in which the person grows up certainly colors the later results of the conflict involved in dealing with the problems of life and with the difficulties into which the organism gets as a result of exposure to infections. I was greatly interested, as I always am, to hear Dr. Schilder explain his approach to medicine, because he started out as an organicist. I think that is after all the safest approach to the whole problem of clinical medicine.

DR. FOSTER KENNEDY: If one were to speak of and stand by only those things which one knows, there would be a great silence in the world. I do not think there is any doubt but that these deliberations regarding the psychologic origin of deramatologic ailments probably fill the hiatus created by the present ignorance of the pathology both of the skin and of the mind. Such deliberations keep the mind active, even if they do not always cure the disease. The skin is one's universe

in little. It is the extension of oneself. It is no accident that the myth of Marsyas being flayed was really his depersonalization for his behavior. That is an oblation to the psychoanalytic school.

It is known that emotional conditions produce alterations in the skin. It is no accident that the skin and the brain are developed from the same layer in the embryo. There is a relationship, I believe, as well as an interaction between these two viscera. In hyperthyroidism, blotches come and go, playing like shadows over water on the skin of the patient. The skin is sensitized by the endocrinologic situation and possibly by the emotional situation thus engendered. I believe that stigmas of the crucifixion appeared in the saints, but I do not believe that the stigmas appeared entirely spontaneously. I believe that they occurred in persons with sensitive skins, with dermatographia (if one wishes to use the jargon of the day), and that the attrition of the nails on the palms produced the stigmas which would not have been produced in a person who was not sensitized endocrinologically and emotionally. The suggestion that herpes zoster is a disease of the mind and of the emotions rather reminds me of gathering simples in a field by the light of the full moon.

DR. JOSEPH HARKAVY: It is difficult for me to discuss this rather complicated subject after so many distinguished men have presented their views. As an internist interested in allergy, I should like to try to coordinate the divergent opinions and see where they meet. I cannot help but feel that each of the speakers has contributed to the understanding of the subject under discussion, namely, dermatologic lesions as influenced by the psyche, and every one is correct up to a certain point. What was most interesting to me was expressed by Dr. Schilder: that there are a dozen or more components in the production of any one symptom complex. These may be psychic to a certain extent; they may be organic, but finally, or rather, fundamentally, I think that they are allergic.

If by allergy is meant an altered capacity of the cell to react, it must be borne in mind that altered reactivity may be inherited or acquired and can be induced by many agents. In allergic reactions in organs of the body other than the skin, the same holds true. Such allergic manifestations, originally induced by a specific agent, as described by Dr. Walzer, recur on repeated stimulation by the same agent in the same tissue. The allergist calls such a reacting organ the "specific shock tissue." For instance, urticaria develops after a person has eaten shellfish. Repeated irritation of the skin by the ingestion of shellfish ultimately lowers the threshold of functional activity to such an extent that almost any stimulus may elicit a similar reaction, whether it is a psychogenic influence, food or the physical factor of cold or heat. The last two factors, by the way, are extremely important and I think have been neglected by most of the speakers.

When one talks about certain exciting factors as being responsible for a group of symptoms in the skin, the blood vessels or elsewhere, one has comparatively little knowledge of the physicochemical changes resulting in the human organism from such stimulation.

Lewis and Duke have shown that physical agents, such as cold, heat, stroking or insertion of a needle intracutaneously, may produce urticarial whealing, even as do eggs, fish or the stroking of a dog or horse in allergic subjects. Such wheals, according to Lewis, are associated with the liberation in the skin of a histamine-like substance. I have seen patients who are so sensitive to cold that immersion of the arm in cold water or the application of ice to the skin is followed by urticaria or asthma. Exposure to the sun may produce marked urticaria and dermatitis in certain persons who are susceptible to the actinic rays. Such results may also result from heat alone, no matter what its source.

There is therefore no reason why emotional stress accompanied by a rise of temperature cannot precipitate similar chemical changes, especially in fundamentally allergic persons, followed by manifestations comparable in every way with those originally induced by a specific excitant.

What effect the psyche can and does have upon the metabolic and physicochemical changes in the organism is still an unexplored field. Extensive investiga-

tion is yet to be done in order to determine the influence of psychogenic stimulation on the endocrine glands and on the autonomic nervous system, which may lead to changes in capillary permeability and to the liberation of hormones and a histamine-like substance, resulting in injury to the tissue.

I was, therefore, greatly pleased to hear what Dr. Schilder said this evening and to realize that at last the psychoanalysts are beginning to think and talk of a unified personality, influenced not merely by the psychologic but by the organic processes.

Dr. Bela Mittelmann: I should like to make a few remarks in connection with Dr. Schilder's and Dr. Walzer's statements as to the presence of both organic and psychic factors in some diseases of the skin. The organic factor is at times easily overlooked because of the fact that itching may be the only symptom of an allergic condition. The patient may not present any eruption on the skin and may have only the sensation of itching. This, as well as other symptoms, is often disregarded and considered psychogenic. I have one case in mind which I studied carefully, that of a patient who suffered from so-called neurotic excoriations for about ten years. This condition was so severe that the patient produced huge wounds on her face and actually destroyed the tip of her nose. In fact, she underwent three plastic operations to restore the shape of the nose and then started to carve the new flap. This patient, as I proved, had a definitely allergic background. She had itching of the skin and also vasomotor rhinitis. Earlier in life she had had urticaria. She was definitely sensitive to bacon and to any kind of pork but did not know it. If bacon was used in preparing her food, no matter what the food was, vasomotor rhinitis and itching would develop. Following the elimination of the allergic agents and with psychotherapy a cure was effected. Elimination of the allergic factors alone did not suffice, for without the neurotic element the patient would not have produced the neurotic excoriations. Besides, it was definitely shown that the itching and some other less definable sensations in the skin had not only an allergic but a psychic background. That is one type of case in which one can prove the presence of both factors.

Psychologic Motives in Tattooing. Presented by Dr. Walter Bromberg.

The material on which this brief study is based is taken from the Psychiatric Clinic of the Court of General Sessions. During the past year (1933) I had an opportunity in the routine examination of prisoners to study young men who were tattooed. Many of the principles brought forth tonight in the discussion of the psychology of the skin are illustrated by tattooed persons. The first striking observation which was made was that in all of the persons who were tattooed the decision to have a design applied was made impulsively. It was as if some great resistance had to be overcome. This resistance took two forms; in one, it was the overcoming of the social taboo against marring the skin; in the second instance it was the natural dislike to injure the narcissistic organ, i. e., the skin. From a deeper point of view the skin is to most persons a perfect organ. It is sacred when it is unadorned (except by nature) and contains all of the elements of beauty. The skin is indeed a reservoir of narcissism. The impulsive decision to be tattooed was usually carried out under the influence of friends. Often men who were tattooed had the tattooing done while they were in an alcoholic state, and almost always the friends who accompanied them were themselves tattooed. Thus one sees in operation the influence of a latent homosexual factor. Another instance of the activity of the homosexual factor is expressed in the very symbolism of the tattooing needle and the fluid, the infliction of pain by an older man (i. e., the tattooer), by the absorption of sadomasochistic feelings in the subject and by the fact that the repression against homosexuality is weakened by alcoholic intoxication. A good case to illustrate this fact is that of a man who said that he was tattooed in Shanghai while in the navy during a drinking spree. Later, when he recovered from the intoxication, he was extremely sorry that he had had it done. The next time that he was in Shanghai with the same companion he had another tattoo "piece" put on, again under the influence of alcoholic intoxication. Later he was again sorry.

In a general way there are two types of men who bear tattooed designs. There is the older, usually more virile type of man, often a sailor, who is satisfied with his designs and who adds to his collection slowly over a period of years. This type is clearly exhibitionistic. At the extreme end of this group are the professional tattooer and the performer in a circus. The other group is comprised of young men who wish to bolster their feelings of inferiority by being identified with strong men, for instance, young sailors. These men quickly become disgusted with their pictures and do not have new designs put on except during a few years in their adolescence. The social taboo is on the surface in these men, and they will often say that the tattooing makes one look "vulgar and rough." Fundamentally, however, this feeling is a counterpart of the fear of castration. These men are apt to choose designs which express anthropomorphism, such as pictures of stalwart warriors, boxers, Indian braves and so forth. They feel the need of increasing their aggressive tendencies by wearing tattooed designs depicting strength. Exhibitionism and aggression are united, for example, in the sailor who is not afraid to display his tattooed designs or his bulging arm muscles, broad chest, etc. In this connection, it is interesting to see the relation of the tattooing of the sailor to narcissism. In the days of sailing vessels, sailors on their long trips frequently tattooed each other; in fact, that is thought by some to be the origin and development of American tattooing. In the older days sailors, because of their infrequent association with women, the absence of a heterosexual love object and their intimate association with each other, were apt to express their latent homosexual feelings in tattooing; moreover, the arms and the chest were frequently used as sites for their designs. According to the theory of "genitalization of the body" described by Lewin and others, in which the arms and even the chest are a phallic representation, tattooing on the body should provide a direct type of narcissistic and auto-erotic gratification.

It is difficult to study women in the clinic from the standpoint of tattooing because the material is poor, except for a few prostitutes who have obscene tattoo marks on the body. In this connection, it is interesting to note that about 1897 there was a wave of tattooing among women in this country, and the story is that one of the Vanderbilts started it with a tattooed butterfly on her shoulder. In that case the lifting of the social taboo was an important point. Apparently women can express more narcissistic erotism by clothes than they can by tattooing.

The types of pictures which are tattooed are strikingly diverse, but they are all illustrative of important principles. The most frequent type is the pictures of sexual objects, usually nude women accompanied by obscene statements. Frequently one sees homosexual pictures such as the design on a man's back of a cat chasing a mouse down toward the anus, in which the mouse has half buried itself. In the majority of instances the pictures of sexual objects proclaim the heterosexuality of man. At the same time they represent the final expression of the Oedipus situation combined with a marked sense of the guilt arising therefrom. This is nicely illustrated in the case of R. B., a young man of 21, who had on the right thigh, a picture of a nude girl with the words "get hot" and on the right arm a picture of a girl's face. He said that he had felt proud of the pictures for about a month and then had became disgusted. On the left arm he had pictures of a cross and the word "mother" beneath it. He said that he wanted to keep all that "stuff" (girl's figure and head) on the same side of the body, because his mother's picture was on the left. His discomfort at having the tattooed designs was an expression of his feeling of guilt against an incestuous wish—expressed on the right side through the heterosexual designs and atoned for on the left side by the cross with his mother's name. The left side of the body is well known psychoanalytically as the side of guilt.

Another type of picture is the representation of ships, horses, historical figures, etc. These pictures show an anthropomorphic tendency and contain the elements of primitive art. They are also allied to the type of figure which seems to identify the person with certain times and events. Thus, some young men put dates, girls' initials and names of friends and sweethearts on their skin. I observed at Bellevue a boy of 16 with a depressive psychosis who said that his friends made a cross

on the skin which they impregnated with dye so that they could tell a year later what had happened a year before! This is a curious example of the tendency to attain some sort of fixation in time and brings to mind the tendency of adolescent children to carve their initials and dates on trunks of trees and elsewhere. However, it is difficult to account psychologically for the presence of humorous tattooed designs, such as pictures of Mickey Mouse and characters from the comic strips.

A third and common type of tattoo design is the sadistic: pictures of skulls, daggers, blood, etc., all representing strong sadistic phantasies. I have often seen knives with an unusually liberal supply of blood. One of the tattooers of New York is famous for and proud of the livid dye he uses for representing blood. I have observed a defective boy, B. I., aged 18, who is extremely immature emotionally and physically as well as mentally. He bears the design of a large dagger cutting through a cuff of skin with a large amount of red blood dripping from the dagger and lining the pictorial cuff. In addition he has a heart tattooed in red, a cross with blood and several other religious motifs. This boy showed prepubertal sadism and aggression in his choice of designs. He is rather proud of the pictures, particularly of the dagger and the blood, and once remarked to me that the dagger was not really going through his skin! The expression in this case of the aggression which is part of the make-up of most boys in the prepubertal stage coincide with the boy's general immaturity.

A fourth type of frequent tattooing motifs is pictures concerned with death and questions of honor and guilt. Frequently these are represented by a picture of a cross with the word "Mother" beneath, with the date of her death or with no date if she is living. Often there is the picture of a skull with the words "Death before dishonor" above it. The religious motives are extremely common, pictures of the crucifixion, sometimes highly elaborate ones, covering the entire back. It is interesting that in the religious pictures the initials "I H S" (which translated, means Jesus, Savior of Humanity) are interpreted "I have suffered" or "I have sinned;" and "I N R I" (which, translated, means Jesus, Born King of the Jews) is interpreted "Iron Nails Rusted In." At the bottom of this type of picture, particularly tombstones with dates and names referring to the mother, is the strong feeling of guilt involving the Oedipus situation. It is interesting in this connection that rarely does one see designs dedicated to the father. A youth F. C., aged 19, with marked emotional and vasomotor instability and of an egocentric immature type, who has assumed an air of callousness as a shell to cover his feelings of inferiority, bears a design on his left arm of a skull with the words "Death before dishonor." He said he took the tattoo on a dare. From a psychologic point of view it was a challenge to his sadomasochistic and narcissistic tendencies. He threw further light on the situation by saying that he was a neat dresser and was particularly fond of form fitting clothes but became embarrassed easily if people made remarks about his ultrastylish clothes. He said that his mother threatened to cut off his arm while he slept when he came home with a tattooed design. Whereas he was previously proud of his design, he became extremely sorry that he had had it done and was frightened and ashamed. He said that he was ashamed because "people see you at the beaches and think you are a rowdy." This boy then transposed the fear of castration (in this case the threat was administered by the mother) to a fear of social condemnation, i. e., that people would not like him at the beaches.

The fifth type of pictures, in a rough way, represent those of the professional tattooer and the exhibitioner, who have new designs applied from time to time, some of the men being tattooed from head to foot. The pictures of the professional tattooers represent a special type. These men exhibitionize with little sense of guilt, regard their craft as a profession and derive constant gratification from the pictures on their skin. There are a few tattooers who are not tattooed extensively and are sorry that they ever went into the business. Most of the tattooers show by their placidity the lack of a feeling of guilt and the constant pleasure derived from erotization of the skin through tattooing. It is interesting to see that from the older men less material is obtained that helps in the psychologic study of

tattooing. This is either because their sense of guilt has diminished as they grow older or because they belong to a group who are proud and derive pleasure from their designs. One case, J. B., illustrates this point to a certain degree. J. B. is a man of 40 who has been heavily tattooed from time to time. He has many designs on his arms and a large ship on his chest; the only comment he has made is that he did not mind the pain of any of them except the one on his chest. Another man who belongs in the same category shows some of the same features. G. R., aged 33, a ne'er-do-well, nomadic person, came from a good family. His father rose from the rank of a private to that of major in the army. The patient considered himself to be the "black sheep" of the family. He is a chronic alcoholic addict and obtained his tattoo designs while in the navy. He made a poor heterosexual adjustment in life and has had definite indications of a latent homosexual tendency. He once said that when "you are in the navy you feel bigger, like a real salt, when you are tattooed, but when you are out of the navy you feel sorry; it makes you look tough." In this case it seems clear that his attempt to identify himself with his virile and successful father, the professional soldier, was a factor in his getting tattooed. Here again the homosexual factors of a life in the navy and alcohol helped him to carry out the identification with his father through the tattooing. When he left that environment he felt ashamed of the pictures.

The development of tattooing in its psychologic implications can be understood by its close analogy to the psychology of clothes. As is well known, erotic gratification is derived from the skin and from the activity of muscles and joints predominately in young children. With the approach of puberty the eroticism of the skin is displaced to the clothes. The pleasure that is derived from the skin is then transferred to clothes, where it remains, with individual variations, throughout life. This displacement is a normal reaction and accounts for the sudden attention to clothes which is exhibited by the average adolescent boy or girl. The high school sophomore, with his flashy ties, neatly pressed flannel trousers and colorful belt, illustrates this tendency. It is but a short step backward to transfer the eroticism in clothes to that of the body by means of tattooing. This regressive tendency quickly subsides in the average young person. This also explains why so many relatively normal young men are tattooed. In the professional exhibitor, however, who has a type of personality that is entirely different from that of the average person, the regression remains fixed and only gratification and pleasure are obtained from the tattoo pictures. The sense of guilt which immediately arises protects them from further tattooing; they merely have a fading picture to which they pay less attention later in life as a memento of this slight regression. The social taboo which operates in tattooing is seen to a lesser extent in clothes as the striking colors of the adolescent give way to the more conservative clothes of the mature person. This change occurs at the time when the libido is beginning to obtain sexual satisfaction along genital channels. At the same time, a movement is visible in the deeper psychologic layers of the psychosexual make-up which relates to the Oedipus situation. On coming out of puberty the youth transfers his heterosexual love from his mother (Oedipus situation) to the outside world, i. e., to girls and women in his environment. In the process of transferring the Oedipus object to the outside world he usually makes his obeisance to the incestuous drive by the tattoo picture of a cross with the word "mother" under it or by others of that type. The case of R. B., already cited, illustrates this point.

F. M. is a youth of 19 whose great interest in aggressive sports masks a feeling of insecurity. He has marked vasomotor instability which is represented in frequent blushing and by his becoming easily embarrassed. The feeling of insecurity and the erythrophobia are probably guilty feelings related to masturbation. This boy is an enthusiastic member of an athletic club and is interested in boxing. He states that at the age of 18, when he had his first tattoo put on, he wanted to fly from the tattooer, but he had it done because of a feeling of bravado when among his friends. He said: "I was frightened about those needles; I got scared, but didn't want to be a coward. I wanted to run away as soon as I was finished. I had a feeling that was something like that when I first had intercourse.

Some fellow wanted to break me in; I was very much ashamed and when I finished I couldn't stay there; I felt like running away." This boy has a tattoo picture of a boxer on his right arm and that of a girl on his left. Here we see the transfer of guilt from masturbation, similar to that existing at his first heterosexual relation, to the tattoo picture. C. O. illustrates a different source of the feeling of guilt. He is a man of 21 with a German father and a Puerto Rican mother. His father was a sailor and a captain of sailing vessels for thirty years; he was extensively tattooed over the arms, chest, back and body. The boy is proud of his father. He once said, "The sailors tattooed themselves in those days." In New York one time, while in the company of a German man who was tattooed all over his body, he allowed himself to have several pictures put on, but first he had his mother's name tattooed on his arm. He says that the tattoo did not hurt, but that he was a little frightened and, "I was kind of forced into it but I had my mother's name put on first." The boy says that his father was never sorry that he was tattooed but that he himself was a little sorry later, although on the whole he was rather pleased. Here we see obvious identification with the father. The actual seduction curiously enough was through a man who was equated to the father. At the same time he had his mother's name put on as a representation of the feeling of guilt involved because of the strong identification with his father, undoubtedly on a latent homosexual basis.

(The slides of tattoo designs which are demonstrated were taken from a book by Albert Parry [Tattoo, New York, Simon & Schuster, Inc., 1933]).

MINNESOTA DERMATOLOGICAL SOCIETY

Van der Horck Commemoration Meeting, April 21, 1934

L. H. WINER, M.D., *Secretary*

D. D. TURNACLIFF, M.D., *President*

DISSEMINATED MILIARY PAPULAR LUPOID. Presented by DR. H. E. MICHELSON, Minneapolis.

This woman, aged 47, states that her eruption is of two years' duration and that there have been periods when it was somewhat improved. She states that five years ago she was found to have a tuberculous kidney. One niece died of tuberculosis and a niece with active tuberculosis is living in the patient's home. The disease has been entirely asymptomatic.

There are now multiple papules, varying in diameter from 1 to 3 mm., located on the face, neck, back, arms and abdomen. Some of the lesions are almost the color of normal skin; others are light red, and some are slate-colored. Examination of the blood gave negative results.

Sections from a biopsy specimen are presented.

ROSACEA-LIKE TUBERCULID. Presented by DR. H. E. MICHELSON, Minneapolis.

This woman, 28 years of age, states that during adolescence she had pulmonary tuberculosis, which is healed at the present time. The eruption on her face began three years ago as numerous papules and pustules over the cheeks and chin. It was diagnosed as acne and treated with ultraviolet rays from an air-cooled quartz mercury vapor arc lamp and with scaling preparations. The patient's general health has been good. The Pirquet test was strongly positive. The Wassermann test was negative.

The eruption consists of minute granulomatous papules which under pressure with glass resemble tiny lupus nodules. There is no exudation or crusting. Treatment with gold salts caused a moderate degree of involution.

TUBERCULOUS ULCER (PRIMARY COMPLEX). Presented by DR. H. E. MICHELSON, Minneapolis.

This white youth, aged 18 years, a student, was well until January 1934. At that time his left ankle began to swell and became extremely painful when he walked. A physician treated him with a lamp and obtained pus by aspiration on two occasions. The boy then came to the University Hospitals, and on March 1, 1934, a wide incision was made into the fluctuant abscess, from which cheesy material was obtained. The lesion has not healed. At the time of admission roentgen examination of the left ankle showed no pathologic change in the bones. A recent examination showed disuse atrophy and slight erosion near the internal malleolus but no osteomyelitis or primary pathologic process in the bones or joints of that region.

There is now an ulcer on the medial surface of the left ankle which measures 13 by 7 cm. This is roughly oval and sharply marginated, and its central portion is composed of exuberant granulations. There is no pain on movement of the ankle. The slightly undermined edge is soft, and there is considerable purulent secretion oozing from the surface.

The Wassermann and Kline tests were negative, and the blood showed 17,500 white cells, of which 82 per cent were neutrophils. Smears and cultures of the pus showed only staphylococci and streptococci. Guinea-pigs had been inoculated to determine whether tuberculous infection was present, and the result was positive for tubercle bacilli. Sections from a biopsy specimen are shown.

LUPOID LESIONS OF THE SKIN WITH ACTIVE TUBERCULOUS FOCI. Presented by DR. D. D. TURNACLIFF, Minneapolis.

M. A., aged 32, white, single, was admitted to the hospital with a diagnosis of tuberculosis of the spine and was transferred to Glen Lake Sanatorium on Jan. 23, 1930. The sputum yielded tubercle bacilli, and the Mantoux test was positive. There was no history of syphilis, and the Wassermann reaction was negative. There was no family history of tuberculosis.

The diagnosis was far advanced pulmonary tuberculosis and spondylitis of the fifth, sixth and seventh dorsal vertebrae.

In 1930 effusion developed in the left side of the chest. Also in 1930 the patient noted a lump half the size of a pea in a tattoo mark. New lesions developed in the tattoo mark and showed moderate increase in size but no peripheral spread or coalescing. No more new lesions developed until 1932, when a group of papules the size of a large pinhead appeared in the inner canthus of the left eye. Shortly afterward another group appeared on the other eyelid. New lesions have continued to develop over the face, neck and scalp, some as groups of papules and some as larger flat, lesions. During the past year the small, flat, squamous lesions in front of the right ear (the location from which the first biopsy specimen was taken) and in the left ear have increased to about twice their original size by peripheral extension. The characteristics of the lesions on the eyelids suggest lupus miliaris disseminatus. The lesions have not increased markedly in size, nor have any disappeared or ulcerated except after destructive therapy.

In September 1933 all of the lesions in the upper portion of the tattoo mark were cauterized, and a large keloid developed in the burn. This has contracted to about one-half its original size under roentgen therapy. The smaller lesions in the lower tattoo mark were also cauterized, though less severely, and have nearly disappeared. One lesion on the chin has flattened following the administration of three-fourths skin unit of roentgen radiation one month ago.

DISCUSSION ON THE FOUR CASES JUST PRESENTED

DR. OTTO FOERSTER, Milwaukee (by invitation): The large and interesting group of cases presented is remarkably complete in illustrating the response to tuberculous infection from various sources and the varying degree of reactive ability of the individual patient as expressed clinically. I think that later Dr. Michelson

will tell some of his views on the pathogenesis of tuberculous lesions. The individual state of immunity and its importance in determining the peculiar and varied manifestations of cutaneous tuberculosis are aptly compared with the spectrum by George Rost in his excellent textbook. At one end of the immunologic spectrum is a high degree of immunization; at the other is utter lack of protection, and in between all degrees of reactive ability are possible and are expressed clinically in great variety, ranging from benign states only recently etiologically associated with tuberculosis to grave infections.

Dr. H. E. Michelson, Minneapolis: Since the dermatologists in this region have made a hobby of tuberculosis of the skin we have made many observations, and on comparing our conceptions with those in the literature we are beginning to realize that tuberculosis of the skin in the American and in America does not conform entirely to the more or less accepted views of the continental observers. The chemical aspects of the diet from birth, the difference in hygienic surroundings, the early hospitalization of persons with pulmonary tuberculosis and the effective campaign against tuberculosis are certainly effecting a change in the behavior of cutaneous tuberculosis. For example, we have seen people with advanced pulmonary or active adenoid tuberculosis show outbursts of papulonecrotic tuberculids. We have seen the establishment of drainage produce an immediate change in the character of the skin lesions. Maybe allergy is not the entire explanation for some of these phenomena. Apparently there may be a very active focus as a potential portal of entry of infection into the blood stream, but with surgical drainage the blood stream may be spared. I am certain that if we continue to observe this picture accurately we shall eventually be able to add a great deal to the present day knowledge.

The patient with the large ulcer on the ankle I believe is a striking example of the primary tuberculous complex. The patient has no signs or symptoms of systemic tuberculosis. His general health is excellent. There is marked inguinal adenitis, and on section one of these glands is studded with tubercles. The prognosis is good even though it will take months to effect a cure.

Dr. S. E. Sweitzer, Minneapolis: After my associates and I saw the patient with miliary papular disseminated lupoid we waited to make a diagnosis until we received the report of the biopsy on the numerous lesions. The only similar case that I can recall in my experience is one of multiple sarcomatosis which I observed a number of years ago, but in that case the condition was sarcoid. Certainly it is an education to see this one case.

The case of the patient with the skin lesions with active foci is interesting for the reason that the lesions are different from ordinary sarcoid. There are distinct depression and atrophy.

Dr. C. D. Freeman, St. Paul: The man with the ulcer told me that he has had the lesion since January 1934. The ulcer on his ankle is almost the size of one's hand. All around the lesion there is a border about ¼ inch (0.6 cm.) wide that is healing. I suggest that the patient be treated conservatively. If that were my leg I should not permit amputation at this time. It is interesting that a tuberculous ulcer could develop to such a size in four months.

Dr. F. R. Wright, Minneapolis: The ulcer was originally a cutaneous lesion. It was interfered with surgically. The underlying tendon sheaths are now involved, and the case is no longer one for the dermatologist. The boy will ultimately, in my opinion, lose his foot. If he is financially able to spend from two to five years under medical care he may possibly get well.

Dr. L. H. Winer, Minneapolis: When this case of ulcer was first presented at the university we were rather stumped, but when we examined the biopsy specimen we presumed that the lesion was tuberculous. At that time I brought up the question of the patient's having avian tuberculosis. Not more than four or five similar cases have been reported in the literature, and two of them were presented several times at various meetings in Vienna. One was shown by Professor Volk and the other by Docent Urbach. They had a marked resemblance to this case except that the lesions, although large and ulcerated, were multiple. In this case there is a single lesion.

DR. JOHN BUTLER, Minneapolis: On being questioned the first patient said that the lesions varied in size, at times becoming larger after the skin was rubbed. This suggests nonpigmented urticaria pigmentosa rather than sarcoid, which would not give this reaction.

DR. HAMILTON MONTGOMERY, Rochester: The histopathologic picture seen in the case of ulcer is similar to that of scrofuloderma. I believe that ten or fifteen years from now the terminology of tuberculosis of the skin will be greatly simplified, the condition being divided into two types: (1) localized and (2) hematogenous. Among the localized forms of tuberculosis is the primary tuberculosis complex such as is seen in Dr. Michelson's case, but to be included also is the inoculation type of tuberculosis, referred to by Stokes and O'Leary, which is characterized by a variety of manifestations of the primary lesion together with marked lymphangitis and involvement of the neighboring glands. At times the primary lesion may resemble lupus vulgaris, and at others tuberculosis verrucosa cutis or an anatomic tubercle. The latter form is probably the result of inoculation with the human tubercle bacillus, whereas in some of the other forms of inoculation tuberculosis, especially those in which the primary lesion is like a furuncle or is nonspecific, it is likely that the infection is of the avian or the bovine type. This theory remains to be proved, but it is being worked on further. There is a divergence of opinion as to whether lesions of this type should be treated by roentgen irradiation alone or by surgical excision with or without subsequent roentgen treatment. This can be determined only by observation of a larger group of cases over a longer time.

DR. OTTO FOERSTER, Milwaukee (by invitation): I think that the emphasis placed on the change in the concept of the reactions of the skin to tuberculous infection as modified by factors in the host and in the organism is the outstanding point brought out by the discussion. The cases represent both human and bovine infections and I am not so sure that the avian tubercle bacillus was the causative agent in the case of tuberculous ulcer. This is a remarkable collection of cases presented at one time.

RACEMOSE LIVEDO. Presented by DR. S. E. SWEITZER, Minneapolis.

M. D., a white woman aged 50, has complained of pain in both legs for the past six weeks. Before this time there were no symptoms except claudication, intermittent chilliness of the lower extremities and what the patient describes as "poor circulation."

The condition first appeared in the left leg, with swelling and nodular induration just below and on the lateral surface of the knee, the involved area being several centimeters in diameter. The skin was violaceous and painful to touch. In three days a similar condition appeared on the right leg. The lesions were on both the anterior and the posterior surface and were nodular and indurated and painful on palpation. The lesions on both extremities seem to be aggravated by standing or walking.

Physical examination otherwise revealed nothing abnormal except right maxillary and possibly right posterior ethmoid sinusitis. The chest was normal. The Mantoux reaction was strongly positive. The Wassermann reaction was negative. There were extrasystoles of the heart.

Sections from a biopsy specimen are shown.

DISCUSSION

DR. PAUL O'LEARY, Rochester: I suggest that this woman has migrating phlebitis rather than erythema nodosum and that the present circulatory disturbance is the aftermath of the phlebitis.

DR. S. E. SWEITZER, Minneapolis: That is a very interesting suggestion, but in order to have migrating phlebitis one would have to have lesions where the veins are.

SYRINGOMA. Presented by DR. H. E. MICHELSON, Minneapolis.

N. M., a woman, 41 years of age, has had the present eruption since the age of 18. At the time of its onset she believed that it was a heat rash. It first appeared on the neck and gradually progressed until it covered the chest and both arms. There have been no symptoms. The patient states that her mother and one of her three sisters have a similar condition. The patient has also been treated for carcinoma of the breast.

The eruption now consists of multiple pinkish papules from 1 to 3 mm. in diameter on the chest, abdomen, back and flexor surfaces of the arms. Below each eye there are yellowish-white plaques measuring 3 by 2 cm., the result of coalescence of the lesions.

Sections from a biopsy specimen are shown.

ASYMMETRIC ADENOMA SEBACEUM. Presented by DR. H. E. MICHELSON, Minneapolis.

A. R., aged 44, states that the skin lesions on her face have been present since birth, have never grown and have never caused any subjective symptoms.

There are three yellowish-white plaques, from 2 to 3 mm. in diameter, situated on the right cheek and in the center of the forehead. The lesions have slightly depressed centers and raised borders, are firm to palpation and are surrounded by narrow pink halos.

Sections from a biopsy specimen are shown.

NAEVUS SEBACEUS (JADASSOHN). Presented by DR. S. E. SWEITZER, Minneapolis.

M. M., a white woman aged 26, states that the lesions have been present for ten years. Apparently they have changed little since they first were observed.

Many slightly raised, yellowish, firm papules may be seen posterior to the left ear and in the left aural fold. The surfaces are smooth. There are from twenty to twenty-five lesions. The Wassermann reaction and the laboratory findings were negative.

Sections from a biopsy specimen are shown.

DISCUSSION ON THE THREE CASES JUST PRESENTED

DR. HAMILTON MONTGOMERY, Rochester: These cases are interesting because they emphasize the close interrelationship of syringoma, so-called adenoma sebaceum (Pringle) and epithelioma adenoides cysticum (Brooke). The syringoma is typical both clinically and histologically. The asymmetric adenoma sebaceum, however, shows features of syringoma, epithelioma adenoides cysticum (Brooke) and adenoma sebaceum (Pringle).

The naevus sebaceus (Jadassohn) is equivalent to the senile sebaceous adenoma of Nomland and shows merely hypertrophy or proliferation of sebaceous gland structure without any neoplastic change of the basal cells and strands to form cysts or sweat ducts, such as one sees in the preceding group of cases. Microscopic studies are necessary to differentiate the syringoma from epithelioma adenoides cysticum.

PEMPHIGUS (SENEAR-USHER SYNDROME). Presented by DR. H. E. MICHELSON, Minneapolis.

This woman, 48 years of age, states that the eruption has existed for approximately two years and first appeared as blisters on the chest, back and scalp. She visited a physician, who made a diagnosis of impetigo. When the lesions refused to heal under ordinary treatment she was referred to me for diagnosis.

The points of maximum involvement are the chest, the back between the scapulae and the scalp. There are no bullae at this time, and the lesions appear crusted and resemble seborrheic dermatitis. There are a few small crusted lesions on the scalp.

DISCUSSION

DR. PAUL O'LEARY, Rochester: I believe that the loose use of the term "Senear-Usher" should be discouraged, because the great majority of cases to which this name has been given have been instances of pemphigus, while in only a few of them has the condition been lupus erythematosus with bullous lesions. If the term is to be maintained as indicating a borderline type of case it should be qualified by adding either "pemphigus" or "lupus erythematosus;" for example, the condition in the case under discussion might well be called the Senear-Usher type of pemphigus.

PARAPSORIASIS LICHENOIDES. Presented by DR. S. E. SWEITZER, Minneapolis.

N. D., a white man aged 38, of Austrian birth, gives a history of having first observed lesions on his ankles and legs three years ago. The lesions spread peripherally, and there have been no subjective symptoms except that following hot baths or rubbing the lesions would be accentuated.

Many erythematous plaques may be seen on the upper and lower extremities and the trunk. The lesions are dull red macules spreading peripherally and forming plaques. They are covered by scanty adhesive scales. There is only slight induration, and the greater part of the eruption disappears under diascopy. When first seen, the lesions appeared to be plaques, but recently the eruption has taken on retiform characteristics.

Sections from a biopsy specimen are shown.

DISCUSSION

DR. S. E. SWEITZER, Minneapolis: When I first saw the patient I made a diagnosis of the Brocq type of parapsoriasis and tried to hold him for presentation at this meeting. A biopsy was made, and a diagnosis of parapsoriasis was decided on. Later the condition looked like parapsoriasis variegata. I think that it is parapsoriasis.

DR. H. E. MICHELSON, Minneapolis: I do not believe that the condition is Brocq's parapsoriasis. I think that it is a localized form of acrodermatitis chronica atrophicans. I have searched the literature carefully and cannot find a definite statement, especially by the French authorities, that atrophy occurs in parapsoriasis, although the folding of the skin may give that impression. The microscopic picture will not show real atrophy even though there is absence of the granular layer of the epidermis.

DR. OTTO FOERSTER, Milwaukee (by invitation): It seems to me that the condition, though belonging to the parapsoriasis group, is not the lichenoid type of Brocq but the disseminated, large plaque type. The history indicates a recent change to a retiform character, which suggests the possibility of transformation into the lichenoid type, known as parakeratosis variegata of Unna, Santi and Pollitzer. This is an exceedingly rare dermatosis, and has been proved to exist in only a few cases. In fact, Unna stated that he had been obliged to change his original diagnosis in several of the recorded cases after further observation.

DR. F. R. WRIGHT, Minneapolis: Why the condition should be classed as lichenoid is more than I can see. A lichen is a papule. The surface of this patient's skin is as smooth as paper.

NECROBIOSIS LIPOIDICA DIABETICORUM. Presented by DR. H. E. MICHELSON, Minneapolis.

M. H., a woman aged 48, states that she has had diabetes since May 1932. In November 1933 she injured the small toe of the right foot; it became swollen, and she was unable to wear a shoe. She applied a hot flaxseed poultice, which caused the appearance of several bullae on the dorsum of the foot. Neither the original lesion of the toe nor the bullae healed during the following six weeks; so the patient came to the hospital for advice.

At the time of her admission, in January 1934, there were five superficial ulcers on the dorsum of the right foot, the largest one measuring 3 by 6 cm. This was oval and was surrounded by a deep violet zone 2 cm. in width, due to hemorrhage beneath the surface. The other lesions were identical except for size. Two were situated at the level of the malleoli and two at the base of the toes. All were from 1 to 2 cm. in diameter and appeared as bullae from which the tops had been removed. The left leg and foot were normal. After two weeks of therapy with wet compresses the toe as well as the ulcerations on the foot healed. At this time the lesions assumed the characteristics of necrobiosis lipoidica diabeticorum.

All the lesions are similar except in size, and each one corresponds exactly to the site of a previous ulceration. They present as waxy plaques of firm consistency and are sharply demarcated from the surrounding normal skin. The purple color of the plaques is not uniform but interspersed by yellow foci. The surfaces are capped by thin, white scales. No telangiectatic vessels can be observed.

NECROBIOSIS LIPOIDICA DIABETICORUM. Presented by DR. H. E. MICHELSON, Minneapolis.

K. D., a girl 10 years of age, has been under treatment for diabetes for five years. The first cutaneous lesion appeared on the lateral surface of the right ankle about three years ago and has changed little in size and appearance since it was first noticed. About eight months following the onset of this lesion a second one appeared on the right leg, as a red "pimple" resembling a mosquito bite. Two more lesions developed on the dorsum of each foot eight months ago. These were lighter and smaller than the older ones but were similar in all other respects.

The eruption is confined to the lower extremities. All of the lesions are similar except in size and appear as round or irregular, yellowish-violet plaques, covered by smooth, thin epidermis traversed by minute, tortuous blood vessels.

Sections from a biopsy specimen are shown.

This case will be reported in detail later.

DISCUSSION ON THE TWO CASES JUST PRESENTED

DR. H. E. MICHELSON, Minneapolis: I have discussed such cases of necrobiosis before, and I shall state merely that my present conception is that the lesions are an abortive type of diabetic gangrene and that the deposit of fat is secondary to the initial vascular injury. External trauma plays a part in the localization of the lesions.

DR. CARL W. LAYMON, Minneapolis (by invitation): There has been considerable study both by Urbach and by Balbi as to the type of lipoid present in the lesions of necrobiosis lipoidica diabeticorum. Differential stains for fat constitute one of the chief aids in separating the fatty substances. Both of the workers just mentioned found that the lipoids in the lesions were predominantly phosphatides and neutral fats, and the results of the studies which my associates and I carried out on both of our patients agreed, in general, with their findings. We have decided that the primary injury to the blood vessels is more important than the type of lipoid in the lesions.

In none of the previous reports was there mention of any relationship between this disease and insulin. The younger of our two patients had been given insulin for several months, while the older one had taken no insulin for approximately a year prior to the development of the lesions, which seemed definitely related to trauma.

DR. PAUL O'LEARY, Rochester: The four patients with necrobiosis lipoidica diabeticorum whom I have seen have all had diabetes which had been treated with insulin. It is indeed rare in this day to encounter a diabetic patient who has not received insulin. It is difficult for me to believe that a cutaneous picture as bizarre and striking as necrobiosis lipoidica diabeticorum would have passed unnoticed, and, accordingly, it appears to me to be a new entity in the diabetic patient and not a previously unrecognized one. The point which Dr. Michelson made in

regard to the histopathologic picture simulating that of diabetic gangrene in an extremity is significant because arteriosclerosis is a frequent finding in cases of chronic diabetes mellitus. The local reactions which develop as the result of the too frequent injection of insulin at the same site may result in a gangrenous slough or simply in fatty necrosis without cutaneous gangrene leaving prominent depressed scars. Accordingly, it seems to me that this new entity may be the result of the use of insulin, and that the insulin, even though it is not injected in the vicinity of the cutaneous lesions, may produce vascular injury or precipitate in blood vessels already arteriosclerotic sufficient damage to result in this new cutaneous picture.

A similar mechanism may be involved in the patients with localized solid edema in association with exophthalmic goiter (O'Leary, P. O.: ARCH. DERMAT. & SYPH. **21**:57 [Jan.] 1930) in whom clinical signs of hyperthyroidism are present yet evidence of hypothyroidism is observed in the local myxedematous plaques. I do not believe that insulin when injected into the skin would produce the picture of necrobiosis lipoidica diabeticorum at the site of injection, although its systemic use may be the etiologic factor in this entity.

LICHEN PLANUS (FOLLICULAR). Presented by DR. H. E. MICHELSON, Minneapolis.

A. N., 55 years of age, came to the dermatologic clinic of the University Hospitals in September 1933, complaining of a generalized pruritic eruption, which was most intense on the arms and legs and over the sacrum. The eruption was typical of acute lichen planus and gradually involuted under therapy during the period from September to March. The patient again visited the clinic recently, with the eruption as it is at present.

The condition consists of areas of brownish pigmentation in which there are multiple spinous, keratotic, follicular plugs at the sites of the former lesions. Both the pigmentation and the plugging are most intense on the extensor surfaces of the arms and the legs below the knees and in the sacral region. Recently the plugging has improved spontaneously.

LICHEN PLANUS ERYTHEMATOSUS. Presented by DR. H. E. MICHELSON, Minneapolis.

J. W., aged 52, first noticed an eruption fifteen years ago. The condition has not changed appreciably in character since its onset. It is limited to the flexor surface of the forearm. There has never been any itching, burning or other symptoms.

The eruption is in retiform arrangement, purple and without definite elevation; there is no atrophy, pigmentation or hyperkeratosis. Part of the color of the lesions disappears on elevation of the arm. The area resembles the localized poikiloderma of Civatte.

Sections from a biopsy specimen are shown.

DISCUSSION ON THE TWO CASES JUST REPORTED

DR. OTTO FOERSTER, Milwaukee (by invitation): Both of these unusual cases, particularly the one of lesions on the arm, present the clinical picture that I have in mind as typical of lichen planus erythematosus. It seems possible that injury may have had a part in determining the localization of the disorder in both cases.

CHRONIC DERMATITIS SIMULATING LEPROSY. Presented by DR. H. E. MICHELSON, Minneapolis.

T. J., a man 71 years of age, was first admitted to the University Hospitals in 1925. He was sent in with a diagnosis of leprosy by his local physician. The condition at that time was essentially the same as it is at present. He was examined thoroughly during his stay in the hospital, and no evidences were found

either of leprosy or of leukemia. Biopsy on the skin in 1925 showed only nonspecific chronic inflammatory changes. The patient was not seen again until 1934, when he was again sent in by a local physician as having leprosy. At the time of his second admission there were no evidences of leukemia or of leprosy on general physical examination. The skin of the face, however, is elevated, thickened and arranged in folds, and the entire surface is erythematous, dry and scaly. There are no lesions elsewhere on the body.

Sections from a biopsy specimen are shown.

DISCUSSION

DR. S. E. SWEITZER, Minneapolis: This type of dermatitis, which affects the face and gives the leonine expression that this patient shows, is interesting. I think that in most cases it is a contact dermatitis or due to some condition that affects the patient externally. The last patient with the condition whom I observed I sent to Dr. Rusten to have skin tests made. If one can find out what causes the eruption, one can separate the patient from the offending influence and cure him. This patient has not been tested. In treating the local condition, I think that a good deal can be accomplished by roentgen irradiation after the cause is determined and removed. One can cause absorption quicker by roentgen irradiation than in any other way.

DR. H. E. MICHELSON, Minneapolis: This patient has been under observation for a number of years, and I showed him because I believe that a severe chronic, recurring inflammation eventually brings about anatomic changes; hence the leonine facies. Acute exacerbations do not change the general character of the condition.

DR. J. F. MADDEN, St. Paul: This type of fold formation of the skin can be caused by many different diseases. Inflammations, new growths, leukemia, acromegaly and nevi are some of the more common causes. The deformity is often permanent even though the disease causing the fold formation is cured.

TUBERCULOUS LESIONS OF THE SKIN WITH ACTIVE FOCI. Presented by DR. H. G. IRVINE and DR. D. D. TURNACLIFF, Minneapolis.

We have observed this woman, aged 32, since 1921. She then had papulonecrotic tuberculids over the hands, arms, face, scalp and legs. The lesions on the legs ulcerated and had the appearance of small lesions of erythema induratum.

In 1927 an enlarged gland developed below the right mandible. It was treated with roentgen radiation early in its progress and cleared up. During this period the patient had many fewer lesions on the skin than she had before.

Shortly after this the lesions recurred and persisted until August 1933, when an enlarged gland developed in the right side of the neck; the contents liquefied and drained before roentgen therapy was used. Following the active tuberculous inflammatory reaction in this gland the patient has not had any more skin lesions.

Roentgen examination of the chest in 1927 showed a normal picture. A Mantoux test made in 1934 by Dr. Rusten was strongly positive.

[NOTE.—Three other cases of tuberculids of the skin with active foci were shown by Drs. Irvine and Turnacliff.]

LUPUS ERYTHEMATOSUS ACUTUS DISSEMINATUS SIMULATING SCARLET FEVER. Presented by DR. H. E. MICHELSON, Minneapolis.

This woman, aged 24, was seen on March 1, 1934, by her family physician because of diffuse erythema involving the face and upper part of the body, angina and high fever (temperature, 104 F.). After nine days the erythema persisted, and I was called in consultation. At that time there was marked edema of the face, without oozing, as well as diffuse, deep scarlet erythema extending from the hair line to the level of the mandible. There was a similar eruption over the dorsum and on the chest over the sternum.

The leukocyte count was 9,000. There was a trace of albumin in the urine, and the pulse was very rapid. The patient was extremely weak.

DISCUSSION

Dr. H. E. Michelson, Minneapolis: This patient presents a striking example of acute lupus erythematosus ushered in by symptoms that in every way simulated scarlet fever. In fact, her family physician made such a diagnosis, and only when the condition did not subside was I called in consultation.

Dr. John Butler, Minneapolis: The condition may be subacute lupus erythematosus.

Dr. S. E. Sweitzer, Minneapolis: If the patient lives, it will be the subacute type.

Dr. L. H. Winer, Minneapolis: Several cases have been reported in which the patient suddenly recovered after he was expected to die. In another case there was a remission during pregnancy and the patient later died of acute lupus erythematosus.

NEW YORK DERMATOLOGICAL SOCIETY

Edward R. Maloney, M.D., *President*

Regular Meeting, April 24, 1934

R. H. Rulison, M.D., *Secretary*

Roentgen Ray Dermatitis. Presented by Dr. J. Frank Fraser.

This woman, aged 69, is presented for Dr. William Tod Helmuth III. Thirty years ago she received roentgen treatment for an urticarial eruption on her back, and during one of the exposures she felt a severe burning pain, of which she complained at the time. The inflamed area ulcerated and was healed with difficulty, leaving a scar. Two or three years later the scar softened and ulcerated again; it discharged for about eight years, when it was rendered quiescent by radium treatment. It healed and became hard. Ten years ago the wound again broke down, but it healed and had not been troublesome since then, except for occasional itching, until the patient visited California during the past winter. In January 1934 the wound again began to discharge; it was surrounded by a large area of erythema and was accompanied by intense pain, which still persists, not only in the inflamed area but radiating around the chest and the upper part of the abdomen on both sides.

DISCUSSION

Dr. J. Frank Fraser: This patient is presented in order to obtain suggestions as to treatment.

Dr. George M. MacKee: The patient has had intense pain for some time and is apt to continue to suffer unless something radical is done. Furthermore, there is always a tendency for an ulcer like this one to become indolent and fail to heal entirely, and ultimately to lead to an epithelioma. Even if it does heal, the resulting scar will always be a menace because of the danger of subsequent keratoses, ulceration and cancer. There are a number of palliative measures that might offer relief, but I am much in favor of doing a plastic operation. If the affected tissue is entirely removed, the severe pain will stop almost instantly, after which there will be only the discomfort of an ordinary wound. If the tissue is removed by some one who has had experience in operations on this kind of tissue and the removal is followed by the use of a flap or graft, the patient's troubles will be over in a month or two.

[Dr. Fred Wise, Dr. Paul Bechet, Dr. Joseph J. Eller and Dr. R. H. Rulison agreed with Dr. MacKee.]

ATROPHIC ULCER IN SCAR TISSUE OF NOSE. Presented by DR. A. BENSON CANNON.

Mrs. J. D., a white woman aged 68, first consulted me on April 20, 1934, because of an ulceration on the bridge of the nose of eight and one-half months' duration. She had lupus erythematosus of the nose, the adjacent portions of the cheeks and the upper lip, beginning eighteen years ago. Shortly after the onset of the lupus, she had had from fifteen to twenty roentgen treatments of the affected areas. She was treated by Dr. Fordyce at intervals for five years previous to 1924 with actual cautery of the areas of lupus erythematosus. Three years ago she received ultraviolet irradiation once a week for from six to eight months, although there was no evidence of the old lupus. In the latter part of August 1933 she noticed a sore the size of a small split pea, covered with a scab on the bridge of the nose. When the crust was removed she noticed a depressed ulcer. Since that time the ulcer has been treated with salves and exposure to sunlight. The lesion was injured in an automobile accident in October 1933, after which it increased in size for six weeks; since that time it has remained unchanged. There is no pain or discomfort. The patient's general health is good.

There is an ulceration on the bridge of the nose, measuring ½ by ⅜ inch (1.27 by 0.9 cm.). The base of the ulceration is covered with a yellowish crust with a small area of cartilage visible. The edges of the ulcer are flat, except for the right border, which is raised and soft and contains telangiectatic blood vessels. The entire nose, the adjacent portions of the cheeks, extending for 1 inch (2.5 cm.) outward, and the entire skin surface and the vermillion border of the lip and cheek are scarred. The scarred portion is wrinkled and shows some white and some dark brown areas. Most of the scarred area on the lips and the adjacent portion of the cheeks is hard, with telangiectatic blood vessels. The lips are covered with fine, dry scales.

DISCUSSION

DR. FRED WISE: I should interpret the lesion as a roentgen ray ulcer rather than as a trophic ulcer.

DR. HOWARD FOX: I agree with Dr. Wise that the patient shows evidence of damage due to the roentgen rays on the nose and cheek. I think that the lesion is merely an indolent ulcer such as occurs in tissue injured by roentgen rays.

DR. E. F. TRAUB: I agree with Dr. Wise and Dr. Fox that this ulceration has resulted from previous radiation therapy. I also believe that in the upper left portion of the lesion there is a beginning epithelioma.

DR. A. BENSON CANNON: I think the most important question is whether the lesion is a simple ulceration or a carcinoma. I find it difficult to determine whether it is an ulcer resulting from roentgen irradiation or one occurring in scar tissue because of the absence of roentgen ray telangiectasia around the ulcer, except for a small area. Trophic ulcers are frequently seen in scar tissue where there has never been treatment with roentgen rays. I think that the most probable explanation is that the ulcer is a trophic one occurring in scar tissue, the scar resulting from the lupus erythematosus, the cauterization or the roentgen treatment, most likely or from a combination of these three factors. I cannot specify the particular one responsible.

A CASE FOR DIAGNOSIS (MORPHEA-LIKE TUBERCULOSIS CUTIS? MORPHEA?). Presented by DR. EUGENE F. TRAUB.

This woman, aged 30, single, unemployed, born in the United States, has an eruption on the legs which has been present for eight years. On the anterior surface of each leg there are four lesions in various stages of development. The most recent is a very early nodule deep in the cutis, merely showing slight erythema on the surface of the skin. The slightly older lesions are much larger and are flattened centrally, with a beginning yellowish or waxy color with very tiny superficial vessels appearing at this point. The border shows a slightly purplish

zone surrounded by a narrow halo of erythema. The oldest lesions, which measure several centimeters in diameter, show the picture just described but to a much more marked degree, and in addition there is probably some central atrophy.

Several microscopic sections were examined. The first section showed: In the upper part of the corium were islands of cellular exudate, many of which contained giant cells that were either of the foreign body or of the Langhans type. Many closely resembled both varieties. There was a zone of dense connective tissue which appeared acellular. The changes were present throughout the whole depth of the corium down to the hypoderm as well as in the epidermis. The epidermis was thin and without rete pegs. There was a slight deviation from the normal in the shape of the cells of the basal cell layer and of some of the prickle cells. In the upper part of the corium and separated from the epidermis by a narrow zone of normal connective tissue was a row of focal inflammatory areas. Some were perivascular, and others were not, but most of them contained giant cells, many of which resembled those of the foreign body type. Others were of the Langhans type. There were also lymphocytes and connective tissue cells. Similar areas of inflammatory exudate as well as isolated giant cells were scattered throughout the corium. There was no necrosis. There were also a few islands of closely packed lymphocytes. Between the inflammatory zones, there was collagen. The fibers were swollen and had lost their normal contours. The changes were like those seen in scleroderma. With the Van Gieson stain the fibers took a dull opaque red. The Weigert stain showed broken elastic tissue fibers throughout the section. The diagnosis was: inflammatory stage of scleroderma.

The second section showed: The changes were similar to those seen in the first section, but the areas of diseased collagen were larger. The epidermis showed somewhat more atrophy. The changes in the rete consisted of perinuclear spaces and irregularities in the size and shape of the cells. The location of the cellular exudate was similar to that in the previous section. The cells again consisted of lymphocytes, young connective tissue cells and giant cells in large numbers. The connective tissue above the small arteries appeared increased. The Van Gieson stain showed the connective tissue fibers in the upper part of the corium to be fine and separated by interstitial edema. Many of the inflammatory areas were surrounded by a similar fine network of collagen. The large islands of collagen fibers were dense and heavy.

The blood chemistry was practically normal, the interesting feature being that the sugar content on each occasion was 80 mg. per hundred cubic centimeters or below. The cholesterol content was: whole blood 125 mg. per hundred cubic centimeters; serum, 155 mg.; plasma, 146 mg. The Wassermann and Kline tests were negative. The results of the tuberculin test with various dilutions were: 1:1,000,000, negative; 1:100,000, negative; 1:10,000 negative; 1:5,000 weakly positive; 1:1,000, strongly positive.

A careful medical examination showed no active tuberculosis, although there were several scattered calcified tubercles in the lungs and a slight increase of peribronchial markings.

DISCUSSION

DR. J. GARDNER HOPKINS: I cannot recognize the nature of the lesions clinically, but it seems to me that the observations on the sections almost rule out morphea. There was a tuberculoid infiltration around the blood vessels which, it seems to me, corresponded pretty well to that seen in sarcoid. While the condition is an unusual type of sarcoid, that is the nearest diagnosis I can make.

DR. J. FRANK FRASER: I am rather inclined to agree with the views of Dr. Hopkins, but I cannot come to any definite conclusion from the casual examination which I was able to make here. In places there is infiltration in the subcutaneous tissues which suggests Bazin's disease. I should not, however, state that the patient has that condition. On the other hand, there are some features that resemble morphea, as Dr. Traub has pointed out. There is some density of the collagen fibers, which is characteristic of scleroderma.

DR. FRED WISE: On account of the yellow color of these lesions I am more inclined to think of a diagnosis of morphea-like sarcoid or of Urbach's necrobiosis lipoidica diabeticorum than of that of morphea. Dr. Fordyce observed a similar case with the same clinical appearance in which the section showed a sarcoid in a leprous patient.

DR. GEORGE M. MACKEE: Clinically the condition looks like localized scleroderma or morphea. It has the characteristic dilated vessels, yellow color, translucency, hardness and other features. There is no definite violaceous border, but that is not necessary. I did not see the slides, but the histologic description was very clear. While it is true that one may see giant cells and even tuberculoid structures in many conditions other than tuberculosis, the deep infiltration and tuberculoid structure in this case cannot be ignored. Certainly they are not characteristic of scleroderma. The eruption might fall into the category, mentioned by Dr. Wise, of morphea-like sarcoid. At present I do not feel that scleroderma can be excluded.

DR. E. F. TRAUB: The unusual feature is that the microscopic picture somewhat resembles that of sarcoid or of a tuberculoid-like structure. Apparently this is not an entirely unique occurrence in cases of morphea. The linear arrangement of the lesions on the lower parts of the legs has also been referred to in cases described under the diagnosis acrodermatitis atrophicans, which may or may not be related to the present case. I brought a slide made in a case that was somewhat similar except that the lesions were on the trunk, face and upper extremities. The clinical appearance of the lesions is similar in the two cases, as is the microscopic structure. The pathologist felt that the condition might well be classed as early scleroderma in the inflammatory stage.

LUPUS ERYTHEMATOSUS VERRUCOSUS. Presented by DR. FRED WISE.

Mrs. Alice K. (a patient of Dr. B. M. James), aged 23, was born in the United States. The duration of her eruption is nine years. On the sides of the nose, extending to both cheeks and including the lower two thirds of the nose, there is a dull red area with a distinctly verrucous surface, the border of which is slightly elevated and sharply defined. The surface shows a few irregular atrophic patches. On the adjacent areas of the cheeks the skin shows definite atrophy. No apple jelly nodules are seen on diascopic pressure. There is no evidence of telangiectasia. Two years ago the patient received about thirty injections of gold sodium thiosulphate. Doses of as much as 200 mg. were given without apparent benefit. Roentgen examination of the lungs has not been made. Tuberculin tests are to be made later. The object of presenting the patient is to discuss the possibility of the lesion's being tuberculosis verrucosa cutis.

DISCUSSION

DR. PAUL BECHET: I think that the condition is lupus erythematosus. I have occasionally seen lupus erythematosus as thick and raised and crusted as this lesion. The fact that the patient did not respond to thirty injections of gold sodium thiosulphate does not mean anything because patients with chronic lupus erythematosus are highly resistant to such treatment. I advise Dr. Wise to continue the injections of the gold compound.

DR. GEORGE M. MACKEE: I regard the condition as a remarkably hyperkeratotic type of lupus erythematosus. I think that tuberculosis verrucosa cutis can be ruled out, together with other forms of true tuberculosis. There are not enough vegetations. There are no nodules and no ulcers. I agree with Dr. Bechet that thirty injections of a gold compound in a case like this is not much treatment. However, I feel that treatment with a gold compound alone will not suffice. I suggest that carbon dioxide snow be used also.

DR. J. FRANK FRASER: I agree with the remarks of the previous speakers. I suggest that before further treatment is given a biopsy be made to rule out

tuberculosis cutis. Dr. MacKee expressed my views. I know from experience that thirty injections of a gold compound are insufficient in a case of this kind.

DR. JOSEPH J. ELLER: I agree with Dr. MacKee's ideas as to the case.

DR. E. F. TRAUB: I am probably wrong in disagreeing with the previous speakers, but the eruption suggests to me tuberculosis of the skin rather than lupus erythematosus. The lesion is composed of small nodules with a verrucous surface, is not scaly, shows no telangiectasia and is too elevated for ordinary lupus erythematosus. In fact, none of the clinical features of ordinary lupus erythematosus is present except the location on the nose. The patient is a comparatively young person in whom one might expect tuberculosis rather than lupus erythematosus. I agree with Dr. Fraser that a biopsy should be made before one proceeds further. Should it be proved that the lesion is lupus erythematosus, the history of the failure to respond to intravenous injections of gold sodium thiosulphate would make me suggest the use of intradermal injections of a gold compound into the local lesions. Such intradermal treatment of fixed lupus erythematosus sometimes causes the disappearance of the eruption following a very few injections.

A CASE FOR DIAGNOSIS (DERMATOMYCOSIS?). Presented by DR. JOSEPH J. ELLER.

G. G., a woman aged 47, presents on the palms and soles thickened keratotic plaques accompanied by fissuring in various areas. There is also pitting of the nails. When the patient was first seen, on Aug. 30, 1933, she presented marked dermatomycosis involving the interdigital areas of the feet. Since that time this condition has cleared, but there is a residual hyperkeratosis of the hands and soles which has been recalcitrant to treatment.

The patient has received various treatment, including roentgen and ultraviolet irradiation, applications of numerous peeling salves and injections of calcium thiosulphate. However, the hyperkeratosis has remained practically the same.

DISCUSSION

DR. J. FRANK FRASER: From the clinical appearance of the lesions I am of the opinion that the condition is more likely to be psoriasis than dermatomycosis. There is characteristic scaling as well as stippling of the finger-nails.

Research on psoriasis is in progress. Dr. Gaul, who started this work at the New York Post-Graduate Medical School and Hospital under the supervision of Dr. MacKee and who is also working in Dr. Schwartz' clinic, has demonstrated an abnormal amount of nickel in psoriatic lesions. Dr. MacKee will probably tell the proportion of nickel that should exist in normal skin. In every patient with psoriasis examined a great excess of this metal has been found. I suggest that the presenter have Dr. Gaul take a biopsy specimen by his special technic and make a biospectrometric analysis. If the spectroscopic examination shows an excess of nickel I think it safe to make the statement that the diagnosis of psoriasis will be established.

DR. HANS J. SCHWARTZ: I am inclined to agree that the condition is the result of an underlying fungous infection rather than psoriasis or arsenical keratosis.

DR. PAUL BECHET: I think that the condition is psoriasis, despite the excessive fissuring in the lesion. The punctate lesions on the nails are so characteristic of psoriasis that I think they are confirmatory of the diagnosis for the patch on the palm.

DR. GEORGE M. MACKEE: I do not want to make an unequivocal clinical diagnosis in a case like this. Some help may be obtained from microscopic examination of the affected tissue. Admitting that the patient has had dermatomycosis, and irrespective of that, I believe that the eruption on the palms and soles is psoriasis.

In regard to the examination for nickel of which Dr. Fraser spoke, Dr. Gaul has examined twenty-five patients with psoriasis, of whom some had not been

treated and others had been treated in various ways. One patient had pustular psoriasis of the palms and soles. Most of them had merely typical psoriasis. In all of them, that is in 100 per cent, he found by the biospectrometric method a large quantity of nickel. Among nonpsoriatic persons, among whom there have been one hundred or more with apparently normal skin, he found an excess of nickel in about 10 per cent, but this was only a slight excess, nothing like that which was found in the patients with psoriasis. Thus far the work has been done on the psoriatic lesions and not on the normal skin of the patients with psoriasis. It is not known what the normal skin of the psoriatic patient shows. The significance of the increased amount of nickel is not known, but I do not see how it can be ignored.

DR. R. H. RULISON: I think that the patient has psoriasis. I also think that there is some special factor present when the lesions are on the palms and soles. I have a vivid recollection of two patients with psoriasis on the palms and soles and also elsewhere on the body. The lesions on the palms and soles cleared up under treatment with sodium thiosulphate, but the psoriasis in other areas was unaffected by that treatment.

DR. JOSEPH J. ELLER: The patient had dermatomycosis of the feet, which cleared up; but the residual hyperkeratosis remained on the feet and hands in spite of roentgen irradiation, numerous applications of peeling salves and intravenous injections of calcium. Chrysarobin has also been used.

PSORIASIS OF THE PALMS AND SOLES FOLLOWING AN ATTACK OF ARTHRITIS. Presented by DR. A. BENSON CANNON.

This man, aged 57, a physician, consulted me on April 16, 1934, complaining of a scaling eruption of the soles and palms of four months' duration. The lesions began as small, red, raised, scaly papules and gradually spread at the margins to involve the greater portion of the palms and the palmar surfaces of the fingers, the scales becoming heaped up in layers. The parts have always been dry. He has had a sensation of burning of the palms and soles. The eruption began one week after an attack of severe pain in the back; this was first diagnosed as syringomyelia, but roentgenograms of the spine and scapula showed that there was arthritis which caused pressure on the brachial plexus. He had a similar scaling of the left palm twenty years ago, which disappeared after about twenty-eight days. He states that he had macular psoriasis thirty years ago, which lasted only a short time. He denies having taken arsenic or medicine of any kind. His general health is good.

The greater portions of the palmar surfaces of the fingers are now covered by sharply marginated, pea-sized to larger areas which are macular, red and covered with silver-colored scales in layers. The scales can be macerated between the fingers as dry and silver-colored particles. The nails are stippled with some areas of hyperkeratosis at the sides and fronts. There are no other lesions on the skin, scalp or mucous membranes.

The Wassermann reaction was negative. The amount of arsenic in the blood has not been reported.

Treatment has consisted of two exposures to ¼ unit (70 roentgens) of unfiltered roentgen rays and the application of an ointment containing chrysarobin and salicylic acid, each in a concentration of 2 per cent.

DISCUSSION

DR. JOSEPH J. ELLER: I agree with the diagnosis of psoriasis in a rheumatic patient, but I do not know what the relationship between the psoriasis and the rheumatism is.

DR. HOWARD FOX: I do not think that there can be any doubt as to the diagnosis of psoriasis on account of the typical scaly patches on the palms and the two characteristic changes in the nails, including pitting and onycholysis. In

my opinion the combination of psoriasis with arthritis in any marked form is uncommon. Dr. Russell Cecil, who sees many patients with arthritis, told me that between 5 and 10 per cent of his patients show evidences of psoriasis. This, in my opinion, is a much higher percentage of patients with the two conditions than is seen by dermatologists.

DR. J. GARDNER HOPKINS: In regard to the association of psoriasis and arthritis, there was a rather interesting observation by Dr. Danson last year at the clinic for patients with arthritis at the Presbyterian Hospital. He found agglutinins for hemolytic streptococci in the blood of the majority of the patients with rheumatoid arthritis. Among the controls only patients with psoriasis and lupus erythematosus showed a similar reaction.

DR. A. BENSON CANNON: I have been looking for the association of arthritis and psoriasis for the past several years and have found that fully 35 per cent of the patients with psoriasis have arthritic changes in one or more joints, a condition that can usually be demonstrated by roentgen examination. I have made it a practice to look for a history of scarlet fever, rheumatism and tonsillitis, believing that in all probability a streptococcic infection may be responsible for psoriasis. I understand that about 45 per cent of the patients with psoriasis studied at the Mayo Clinic have some form of arthritis. I recently studied a patient who had acute rheumatic fever with sore throat, a temperature of from 102 to 105 F. and acute psoriasis. Streptococci were isolated in cultures taken from the throat. In addition to the many psoriatic lesions, the patient had many purpuric and petechial hemorrhages in the skin and mucous membranes. As the fever, swelling and pain subsided, the psoriasis cleared up. He returned this morning after an absence of three years, during which time he has had no recurrence of his rheumatism and little psoriasis. I am sure that all dermatologists have seen cases in which psoriasis cleared up during pregnancy and did not recur for from a few to many months. Moreover, psoriasis sometimes disappears for as long as fourteen years after the removal of tonsils. In view of these observations I cannot help feeling that there is some association between rheumatic infections and psoriasis.

DERMATITIS HERPETIFORMIS (EARLIEST STAGES). Presented by DR. FRED WISE.

E. P. B., a man aged 27, from the dermatologic clinic of the New York Post-Graduate Medical School and Hospital, is in excellent general health. On Dec. 12, 1933, he presented himself for the treatment of a very faint erythematous and follicular dermatitis, together with a scattering of tiny vesicles, on the buttocks, groins and legs. He stated that this rash had come and gone spontaneously at irregular intervals for two months and that it was accompanied by mild itching. On the back there were a few scattered discoid lesions, with a suggestion of peripheral vesicles. The eruption soon faded under applications of a soothing lotion, but new vesicular and erythematous lesions appeared a few days later. Examination revealed several well defined crops of vesicular formations, some scattered irregularly, as on the posterior axillary folds, the extensor surfaces of the forearms and the front of the neck, and others forming definite grouped and circinate patches, chiefly on the sides of the neck and in the midarea of the back, the internatal area and the pubic region. Local treatment caused these lesions to fade, but they reappeared with definite exacerbations after several days or weeks.

Not until the patient had been under observation for four or five weeks did the clinical features suggest Duhring's disease. Repeated patch tests with potassium iodide ointment were, however, negative. On March 15, the blood count revealed: polymorphonuclear neutrophils, 52 per cent; large and small lymphocytes, 38 per cent; basophils, 1 per cent, and eosinophils, 9 per cent.

The skin now exhibits grouped vesicular lesions on the neck, in the posterior axillary folds and the sacral area and at the base of the penis. There is moderate itching.

The patient is presented chiefly on account of the paucity of the clinical changes, consisting mainly of faint erythematous areas, presented in the early stages of an initial dermatitis herpetiformis. Further clinical observation has tended to confirm this diagnosis.

DISCUSSION

[The members unanimously concurred in the diagnosis.]

A CASE FOR DIAGNOSIS (DUHRING'S DISEASE?). Presented by DR. JOSEPH J. ELLER.

T. F., a white man aged 57, was first seen on March 12, 1934, at which time he presented on the arms, legs, face and neck bullae filled with clear serum which varied in size from that of a pea to that of a walnut. These were present on mildly inflamed and edematous skin. There were crusted lesions on the ears and neck. There were no lesions in the mouth. The patient's health had been essentially normal except for some vague gastric disturbances.

The patient has received calcium thiosulphate intravenously and calcium by mouth. At the end of one week of this treatment the condition improved. Since March 19 few new lesions have appeared. The edema has subsided considerably, but there still remain various crusted lesions which have a tendency to group. Recently arsenic was administered, leading to slight improvement. There has been persistent itching.

The patient was presented at the meeting of the Manhattan Dermatologic Society on April 10, 1934, at which time a diagnosis of Duhring's disease was made. (The case report was not included for publication with the proceedings of that society.)

DISCUSSION

DR. A. BENSON CANNON: I suspect that the diagnosis is erythema multiforme rather than pemphigus or dermatitis herpetiformis. The patient is a gentile, born in New York City, apparently in excellent health. The lesions are intensely itchy and markedly inflammatory, and a number of urticaria papules and decided dermographism are present, all of which suggest erythema multiforme rather than pemphigus or Duhring's disease. There is absence of the scarring and pigmentation and of the characteristic grouping that one finds in Duhring's disease.

DR. HOWARD FOX: I again call attention to a case that I have shown before dermatologic societies in New York on and off for ten years in which there is a recurring eruption which at times resembles Duhring's disease and at others erythema multiforme. This shows how difficult it is at times to distinguish between the two conditions.

DR. FRED WISE: Erythema multiforme exsudativum of Hebra is characterized by circinate and iris-like lesions on the backs of the hands, often on the cheeks and sometimes on the dorsa of the feet. In Duhring's disease there is a high eosinophil count not only in the blood but in the fluid from the vesicles. The lesions are grouped and recur. Often pigmentation occurs after months or years. This condition is not the Hebra type of erythema multiforme, which is recognized as true erythema multiforme exsudativum, but it might be a polymorphous erythema, possibly of toxic origin. I think it is Duhring's disease.

DR. JOSEPH J. ELLER: The patient had literally hundreds of vesicles and bullous lesions, varying from the size of a lentil to that of a large walnut, when the eruption first appeared seven weeks ago.

DR. GEORGE M. MACKEE: The patient now has a persistent, recurring eruption. In many places the vesicles are small, numerous and grouped. The persistence, the constant recurrences, the severe pruritus and the grouping of the vesicles are in favor of Duhring's disease. The eosinophilia is also in favor of that diagnosis. At times it is extremely difficult to differentiate between dermatitis herpetiformis and erythema multiforme, but in this case the weight of evidence certainly is in favor of the former.

A Case for Diagnosis (Hypertrophic Lichen Planus?). Presented by Dr. Joseph G. Hopkins.

This white man, aged 65, has an unimportant past history except for the recurrence of severe bronchitis at intervals for the past forty years; the nature of the attacks has not been investigated. He has congenital amaurosis in one eye, a familial characteristic. He has in general enjoyed excellent health, but in recent years has been depressed on account of family and business difficulties. He has taken cascara sagrada daily for many years but has used no other medication.

The eruption began in May 1933, when a scaly patch developed following a scratch on the back of the right hand. A similar patch followed a pimple on the cheek, after which the other lesions now present developed rapidly. They have persisted and enlarged somewhat. One of the lesions on the left cheek appeared recently. The patient has received no special treatment except three doses of ⅛ skin unit (56 roentgens) of filtered roentgen rays over the intergluteal lesion. This was followed by an increase in ulceration, and the treatment was discontinued.

The patient has a large frame. He appears thin, undernourished and depressed. There is marked diffuse pigmentation of the skin, which may be normal for him. The wrinkling of the face with age is greatly exaggerated. Otherwise the skin seems normal except for the following lesions:

There are four lesions on the left cheek, measuring 2 by from 0.5 to 1 cm. There are two similar lesions on the right cheek and close to the outer canthus of the right eye, and a large lesion on the right cheek, measuring 1 by 6 cm. There are two plaques on the left side of the neck and one on the bridge of the nose measuring about 2 cm. in diameter, and two on the back of the left wrist measuring 1 and 1.5 cm., respectively. The lesions are sharply defined plaques, pigmented, scaling, apparently hyperkeratotic and infiltrated. In the lesions on the cheeks and on the left hand the thickening is more pronounced at the border, leaving the center somewhat depressed. The lesions on the cheek are studded with huge, conspicuous comedones. The lesions on the bridge of the nose and on the left side of the neck are covered with adherent scales, which are separated at the border and do not show central depression.

On the back of the right hand is a pigmented, faintly scaling, noninfiltrated plaque, measuring 4 by 5 cm., from which four prominent lesions project. The largest measures 1 by 2 cm. and projects 9 mm. from the skin level. The surface is dome-shaped, smooth and horny. The entire lesion is of stony hardness. The other prominences are similar but smaller.

In the upper portion of the intergluteal fold there is an oval plaque measuring about 4 by 5 cm., likewise infiltrated, scaling and raised at the border. There is a superficial ulceration in the center of the lesion. When first seen this ulceration was linear and slight. After three doses of ⅛ unit (56 roentgens) of filtered roentgen rays the ulceration extended, but the borders of the lesion have flattened materially.

The Wassermann test was negative. The blood count showed: white cells, 5,800; polymorphonuclear neutrophils, 65 per cent; lymphocytes, 28 per cent; large mononuclear leukocytes, 7 per cent. Chemical examination of the biopsy material for arsenic revealed none.

A biopsy specimen taken from the large lesion on the right cheek showed the following picture: There were hyperkeratosis and parakeratosis with large keratin plugs in enormously dilated follicular funnels. In places the granular layer was very wide. Atrophy of the epidermis was seen in places. There were also areas of acanthosis. Parts of the basal layer showed a marked disturbance. Often numerous chromatophores were seen in the corium. The corium was edematous and contained large, dilated superficial capillaries. There was a marked infiltration of lymphocytes and plasma cells in the corium. The connective tissue elements were increased. The blood vessels showed thickening. A few eosinophils were seen.

Further sections are to be examined before any attempt at a definite diagnosis is made.

DISCUSSION

DR. FRED WISE: I favor the diagnosis of lupus erythematosus of the infiltrative type, but I also have in mind the possibility of sarcoid. As regards the lesions on the back of the hand, I think that they are of course part of the eruption, but the verrucous element is purely secondary and not a manifestation of the original disease.

DR. HOWARD FOX: I agree with Dr. Wise that the lesions on the face are lupus erythematosus of the fixed type, and those in the mouth are probably the same disease and not lichen planus, because there is too much redness. The verrucous nodules on the backs of the hands do not resemble any form of lupus erythematosus which I have seen. The lesion in the gluteal cleft is of the granulomatous type, which strongly suggests tuberculosis. I think that the man has two conditions which could readily coexist, namely, lupus erythematosus and tuberculosis cutis.

DR. E. F. TRAUB: The patch in the gluteal cleft seems definitely to be a tuberculous ulceration. This lesion seems to clinch the diagnosis, and for the rest of the picture I agree with the remarks of Dr. Fox.

DR. R. H. RULISON: I think that the patient has both tuberculosis and tuberculids of the skin.

DR. GEORGE M. MACKEE: I agree with Dr. Fox that the lesions on the face and in the mouth are lupus erythematosus and that those elsewhere are true tuberculosis. I understood the presenter to say that the patient has had recurrent bronchitis for thirty or forty years. It is possible that he has pulmonary tuberculosis rather than simple bronchitis. It is also possible that he has intestinal tuberculosis, and that may be the source of the infection in the anal region, which was transferred to the hands.

DR. J. G. HOPKINS: I think that the impression gained from the anal lesion might have been different if the members had seen it before the treatment with roentgen rays. It looked then much more like the lesion on the face. It was raised, had a little fissure in the center and was not much ulcerated. It has now flattened out a great deal.

CHEILITIS EXFOLIATIVA. Presented by DR. EUGENE F. TRAUB.

H. M., a white man aged 20, was presented before this society on Nov. 28, 1933. He is again presented for suggestions as to therapy.

DISCUSSION

DR. FRED WISE: Would it be possible to excise the lesion and use mucous membrane from some other part of the body for a graft. I am sure that the ordinary treatment and even the most drastic treatment which Dr. Traub spoke of will not cure the patient. One cannot let the condition persist indefinitely. It will ruin his life.

DR. A. BENSON CANNON: While I cannot add much in the way of suggestions as to treatment, I should like to call attention to the interesting fact that in most instances cheilitis occurs in young people and in those wtih some nervous condition. I have noticed that most of the patients are lip biters or lip suckers and that the development of the cheilitis is secondary to the trauma. I should therefore direct the treatment toward the removal of the nervous factor or habit and, if necessary, resort to psychoanalysis. As to the treatment of the lip itself, I usually depend on keeping the lip free from the accumulations of crust and scales (washing it with a bland soap and water) and on the use of a bland oil or some other grease. Where there is marked fissuring, I should apply crude coal tar.

DR. E. F. TRAUB: The suggestion of Dr. Cannon was a good one. Whether the nervous element in this case was present before the cutaneous process started or is a superadded feature brought about by it I do not know. In order not to

have his lips split, the boy now eats through a tube and takes no solid food. For the same reason he is unable to clean his teeth properly, and they are suffering materially from lack of care. Because of these factors, something radical should be done. The treatment that I had in mind was either a radical excision of the lips or a superficial removal with the cold cautery. With the cold cautery I should use a current that gives a minimum of coagulation and very superficially shave off the entire lip. This would permit more prompt healing, and I believe that the patient would have a rather satisfactory result. I have removed large masses from the mucous membranes of the lips with little deformity, and I believe that this operation could be done with only a trifling amount of deformity if any.

DR. A. BENSON CANNON: My associates and I have successfully treated three people in this way. A girl, in whom the involvement of the lip was not so extensive as that presented by this patient, was cured by the treatment referred to but returned eight months later with a slight recurrence. This was cleared up after about two weeks. Both the girl and the mother admitted that licking and biting the lips were the exciting cause. Recently I successfully treated another patient with a localized cheilitis by freezing the part with ethyl chloride and then paring off the affected tissue with a sharp scalpel and cauterizing the base of the wound. This patient had had the maximum amount of roentgen therapy and had been treated with the desiccating needle and with the cautery.

DR. E. F. TRAUB: I have treated not only this boy but several women with numerous local remedies, the medicament often being incorporated in a lipstick, with only a trifling amount of benefit in any of the cases.

LUPUS VULGARIS OF THE NOSE AND MULTIPLE SARCOID OF THE ARMS. Presented by DR. HOWARD FOX.

This mulatto, aged 45, married, born in Puerto Rico, emigrated to New York City nineteen years ago. She was referred to me by Dr. Samuel Irgang from the Harlem Hospital.

In 1928 she was treated for rheumatism for three weeks, and she has complained intermittently of mild pains in the joints since then. There is no family history of tuberculosis. The eruption began on the upper extremities two years ago and appeared on the nose five months ago.

There is now a confluent mass of semisolid, reddish-brown nodules along the borders of both alae nasi. There is no scaling or ulceration. On the postero-external surfaces of the upper parts of both arms and parts of the forearms there is a symmetrical eruption consisting of about four dozen various-sized lesions. Some of these are oval, rather superficial, pinkish plaques; others are more deeply seated firm reddish-brown nodules involving the skin and subcutaneous tissue and varying in size from that of a pea to that of a twenty-five cent piece. The surface of the lesions is smooth, and there are no subjective symptoms. Histologic examination of one of the nodules removed from the area showed the picture of sarcoid.

DISCUSSION

DR. J. FRANK FRASER: This case is rather difficult to diagnose. Dr. Fox is probably right in his conclusions. The lesions on the arm certainly resemble sarcoid, and the question comes up as to what sarcoid is and whether it is due to the action of an attenuated tubercle bacillus. This question should be investigated.

DR. H. H. WHITEHOUSE: I agree with the diagnosis of lupus vulgaris. I do not know why the whole process cannot be considered of that nature.

DR. FRED WISE: I agree with the two diagnoses made by Dr. Fox, namely, lupus vulgaris of the nose and probable sarcoid of the arms. These diagnoses can be confirmed more or less by possible anergic reactions to tuberculin. Roentgenograms of the lungs might disclose the characteristic picture seen in sarcoid. Also roentgenograms of the bones might reveal the changes in the bones characteristic of that disease.

DR. PAUL BECHET: While Dr. Fox' diagnosis is probably correct, it seems to me that the lesions about the elbow are also suggestive of lupus vulgaris. The lesions on the nose, are frankly lupus vulgaris, and the lesions around the elbows have the reddish-yellow color that the lesion on the nose presents, which is entirely foreign to sarcoid.

DR. GEORGE M. MACKEE: My conception of the case is the same as that of Dr. Fox. The result of graded tuberculin tests may be modified because of the presence of both sarcoid and lupus vulgaris.

DR. HOWARD FOX: I do not see how any one could call the lesions on the arm lupus vulgaris, for there are no apple jelly nodules and the color is entirely too light for this disease. The lesions on the nostrils, however, certainly have the appearance of lupus miliaris disseminatus faciei.

EXTENSIVE FLAT EPITHELIOMA OF THE CHEEK. Presented by DR. FRED WISE.

C. W., a man aged 57, from the clinic of the French Hospital, presents on the left cheek, extending from the zygoma to the ramus of the jaw and from the auricle to the nasolabial fold, a discoid, dark red, somewhat crusted, flat, non-infiltrated plaque, with sharply defined edges and faint telangiectases throughout. On the upper edge there is a faint indication of a very narrow, ribbon-like line, about 1 inch (2.5 cm.) in length, suggestive of the "rolled border" of an epithelioma. The plaque as a whole closely resembles lupus erythematosus, but it did not respond to treatment with a gold compound. On the opposite cheek there are several typical pigmented senile keratoses. The lesions first made their appearance about nine years ago.

DISCUSSION

[Dr. Joseph J. Eller, Dr. H. H. Whitehouse, Dr. Howard Fox and Dr. J. Frank Fraser agreed with the diagnosis.]

Book Reviews

Diseases of the Skin: A Handbook of Dermatology for Practitioners and Students. By S. Ernest Dore and John L. Franklin. Price, $5. Pp. 410, with 46 plates. New York: D. Appleton-Century Company, Inc., 1934.

This book is in succession to Malcolm Morris' interesting characteristic work on diseases of the skin. The authors state that in the beginning they undertook to make a revision of that book, but with the great progress of knowledge in dermatology in recent years they found it impracticable, and in the end they were compelled to write a new book. The work is based on Morris' book, but it is individual nevertheless. The authors have gone through the whole subject of dermatology in the light of their great clinical experience and of the newer knowledge. The book is an able exposition of the subject. It abounds with evidence of first-hand knowledge, both clinical and laboratory, and has that practical touch of common sense in considering problems of disease which characterizes so satisfactorily the best of English works on medicine. While it is handy in size, it is by no means a short treatise; it has 382 pages of closely printed text. It admirably covers the subject of dermatology. It is an interesting and useful addition to existing works on dermatology, which will be found particularly useful to the general practitioner, but which the expert can read with stimulation.

CORRECTION

In the Transactions of the Cleveland Dermatological Society in the November issue (**30**:723 [Nov.] 1934), the word "sympatheticoblastoma" in the penultimate line of the paragraph at the top of page 724, in the abstract of the article by Dr. W. H. Connor, entitled, "Tertiary Syphilis: Aneurysm of the Right Innominate Artery," should read "sympathetoblastoma."

Directory of Dermatologic Societies *

INTERNATIONAL

NINTH INTERNATIONAL CONGRESS OF DERMATOLOGY AND SYPHILOLOGY
American Secretary: Dr. Howard Fox, 140 E. 54th St., New York.
Place: Budapest, Hungary. Time: Sept. 15-21, 1935.

FOREIGN

BRITISH ASSOCIATION OF DERMATOLOGY AND SYPHILOLOGY (CANADIAN BRANCH)
W. R. Jaffrey, President, 64 Hughson St., S., Hamilton, Ont.
Basil Bowman, Secretary-Treasurer, 408 Medical Arts Bldg., Hamilton, Ont.
Place: Montreal, Quebec. Time: May 4, 1935.

ROYAL SOCIETY OF MEDICINE, SECTION OF DERMATOLOGY
Henry MacCormac, President, 23, Wimpole St., W. 1, London.
W. N. Goldsmith, Secretary, 6, Upper Wimpole St., W. 1, London.

NATIONAL DERMATOLOGIC SOCIETIES

AMERICAN MEDICAL ASSOCIATION, SCIENTIFIC ASSEMBLY, SECTION ON DERMATOLOGY AND SYPHILOLOGY
Jeffrey C. Michael, Chairman, 1215 Walker Ave., Houston, Texas.
Harry R. Foerster, Secretary, 208 E. Wisconsin Ave., Milwaukee.
Place: Atlantic City. Time: June 10-14, 1935.

AMERICAN DERMATOLOGICAL ASSOCIATION
Charles M. Williams, President, 114 E. 54th St., New York.
W. H. Guy, Secretary, 500 Penn Ave., Pittsburgh.
Place: White Sulphur Springs, Va. Time: May 2-4, 1935.

SECTIONAL DERMATOLOGIC SOCIETIES

BALTIMORE-WASHINGTON DERMATOLOGICAL SOCIETY
Joseph E. Gately, President, 1129 Calvert St., Baltimore.
Joseph V. Kennedy, Secretary, 1835 Eye St., Washington, D. C.

CENTRAL STATES DERMATOLOGICAL ASSOCIATION
Samuel Goldblatt, President, 3208 Colerain Ave., Cincinnati.
Raymond, G. Senour, Secretary-Treasurer, 19 W. 7th St., Cincinnati.
Place: Cincinnati. Time: 1935.

IOWA AND WESTERN ILLINOIS DERMATOLOGICAL ASSOCIATION
J. C. Kessler, President, University Hospital, Iowa City.
Robert E. Jameson, Secretary, 1014 First National Bank Bldg., Davenport, Iowa.
Place: Iowa City. Time: Oct. 15, 1935.

NEW ENGLAND DERMATOLOGICAL SOCIETY
Rudolph Jacoby, President, 270 Commonwealth Ave., Boston.
J. Harper Blaisdell, Secretary, 45 Bay State Road, Boston.

SOUTHERN MEDICAL ASSOCIATION, SECTION ON DERMATOLOGY AND SYPHILOLOGY
Thomas W. Murrell, Chairman, 17 E. Grace St., Richmond, Va.
C. C. Dennie, Secretary, Professional Bldg., Kansas City, Mo.

* Secretaries of dermatologic societies are requested to furnish the information necessary for the editor to make this list complete and to keep it up to date.

STATE DERMATOLOGIC SOCIETIES

California Medical Association, Scientific Assembly, Dermatology and Syphilology Section

Ernest K. Stratton, Chairman, 490 Post St., San Francisco.
John M. Graves, Secretary, 909 Hyde St., San Francisco.

Florida Society of Dermatology and Syphilology

Chairman for each meeting is elected from city in which meeting is held.
J. J. Saxton, Secretary, 205 Zack St., Tampa.
Place: Miami. Time: February 1935.

Louisiana Dermatological Society

M. T. Van Studdiford, President, 912 Pere Marquette Bldg., New Orleans.
R. A. Oriol, Secretary-Treasurer, Maison Blanche Bldg., New Orleans.

Medical Society of the State of New York, Section on Dermatology and Syphilology

George M. MacKee, Chairman, 200 W. 59th St., New York.
Lopo de Mello, Secretary, Medical Arts Bldg., Syracuse.

Medical Society of the State of Pennsylvania Section on Dermatology

Robert L. Gilman, Chairman, 1930 Chestnut St., Philadelphia.
Fred M. Jacob, Secretary, 7026 Jenkins Arcade Bldg., Pittsburgh.

Michigan State Medical Society, Section on Dermatology and Syphilology

A. R. Woodburne, Chairman, 26 Sheldon Ave., Grand Rapids.
G. Warren Hyde, Secretary, 2501 W. Grand Blvd., Detroit.

Minnesota Dermatological Society

D. D. Turnacliff, President, 407 Medical Arts Bldg., Minneapolis.
L. H. Winer, Secretary, 522 Medical Arts Bldg., Minneapolis.
Time: First Wednesday in October, December, February and April.

Oklahoma State Dermatological Society

C. L. Brundage, President, 1200 N. Walker St., Oklahoma City.
M. M. Wickham, Secretary, 716 W. Symmes St., Norman.

Texas Dermatological Society

C. F. Lehmann, President, 303 E. Houston St., San Antonio.
Everett R. Seale, Secretary, 1215 Walker Ave., Houston.

LOCAL DERMATOLOGIC SOCIETIES

Atlanta Dermatological Society

Francis G. Jones, President, 384 Peachtree St., Atlanta, Ga.
Charles A. Wilkins, Secretary, Medical Arts Bldg., Atlanta, Ga.

Bronx Dermatological Society

Louis Chargin, Chairman, 1 W. 85th St., New York.
Henry Silver, Secretary, 290 West End Ave., New York.

Brooklyn Dermatological Society

Arthur Persky, President, 1750 Ocean Parkway, Brooklyn.
George F. Price, Secretary, 884 Lincoln Place, Brooklyn.
Time: Third Monday of each month except June, July, August and September.

Buffalo-Rochester Dermatological Society

Earl D. Osborne, President, 471 Delaware Ave., Buffalo.
Richard L. Saunders, Secretary, 333 Linwood Ave., Buffalo.

Chicago Dermatological Society

James H. Mitchell, President, 25 E. Washington St., Chicago.
Max S. Wien, Secretary, 104 S. Michigan Ave., Chicago.

Cincinnati Dermatological Society

Samuel Goldblatt, President, 3208 Colerain Ave., Cincinnati.
Raymond G. Senour, Secretary-Treasurer, 19 W. 7th St., Cincinnati.

Cleveland Dermatological Society

R. E. Barney, President, 1021 Prospect Ave., Cleveland.
E. W. Netherton, Secretary, 2020 E. 93d St., Cleveland.

Detroit Dermatological Society

Clyde K. Hasley, President, 1553 Woodward Ave., Detroit.
William G. Saunders, Secretary-Treasurer, 9203 Grand River Ave., Detroit.

Los Angeles Dermatological Society

Moses Scholtz, Chairman, 1930 Wilshire Blvd., Los Angeles.
Nelson P. Anderson, Secretary, 2007 Wilshire Blvd., Los Angeles.

Manhattan Dermatologic Society

Louis B. Mount, Chairman, 256 State St., Albany, N. Y.
Mihran B. Parounagian, Secretary, 126 E. 39th St., New York.

Montreal Dermatological Society

Alberic Marin, President, 1414 Drummond St., Montreal, Canada.
Paul Poirier, Secretary, 2073 St. Denis St., Montreal, Canada.

New York Academy of Medicine, Section of Dermatology and Syphilis

Ray H. Rulison, Chairman, 145 E. 54th St., New York.
E. William Abramowitz, Secretary, 853, 7th Ave., New York.

New York Dermatological Society

Fred Wise, President, 200 W. 59th St., New York.
R. H. Rulison, Secretary, 145 E. 54th St., New York.

Omaha Dermatological Society

J. W. Hellwig, Chairman, 1319 Farnam St., Omaha.
Donald J. Wilson, Secretary, 1216 Medical Arts Bldg., Omaha.

Philadelphia Dermatological Society

Robert L. Gilman, Chairman, 1930 Chestnut St., Philadelphia.
Vaughn C. Garner, Secretary, Greene and Coulter Sts., Philadelphia.

Pittsburgh Dermatological Society

Bernhard A. Goldmann, President, Jenkins's Arcade, Pittsburgh.
J. Cavanaugh, Secretary, 28 Market St., Youngstown, Ohio.

St. Louis Dermatological Society

Richard S. Weiss, President, 3720 Washington Blvd., St. Louis.
M. F. Engman, Jr., Secretary-Treasurer, 3720 Washington Blvd., St. Louis

San Francisco Dermatological Society

H. J. Templeton, President, 3115 Webster St., Oakland, Calif.
John M. Graves, Secretary, 909 Hyde St., San Francisco.

INDEX TO VOLUME 30

The asterisk (*) preceding the page number indicates an original article. Subject entries are made for all articles. Author entries are made for original articles, correspondence and society transactions. Biographies, Book Reviews, Obituaries and Society Transactions are indexed under these headings in their alphabetical order under the letters B, O and S, respectively.

Abshier, A. B.: Glossitis rhombica mediana, report of case with results of treatment, *409
Acanthosis nigricans, 124, 864, 878
Acetarsone Therapy: See also Lichen planus; Syphilis; etc.
  clinical arsenical myelitis and neuritis due to acetarsone; report of 2 cases with 1 death; negative observations at necropsy, 855
Achorion quinckeanum, clinical and cultural observations, 446
Achromia: See under Pigmentation
Acne, acneform responses to patch tests; follicular and papulopustular reactions to selectively pilosebaceous irritants, *566
  cystic acne or tuberculous granuloma? 162
  hydrogen ion concentration of lotions used in, *6
  infantile, 134
  rosacea and Demodex folliculorum, 854
  rosacea, ocular complications, 271
  varioliformis, 156
  varioliformis, intradermal injections of bacteriophage in, 151
  vulgaris, etiology and treatment, 862
Acriflavine hydrochloride, generalized post-erythrodermic leukomelanodermia following treatment, 113
Acrodermatitis chronica atrophicans, 153
  chronica atrophicans and its relation to scleroderma, 276
  chronica atrophicans with macular atrophic lesions on body, 139
  unilateral acrodermatitis chronica atrophicans associated with psoriasis, 877
Acrodynia, acetylcholine in 2 cases, 712
Actinomycosis, dyshydrotic, superficial cutaneous actinomycosis of palms and soles, 580
  primary, cutaneous, with note on Bacillus actinomycetem comitans, 443
Adenitis: See under Lymph Nodes
Adenoma sebaceum, asymmetric, 896
  sebaceous, or benign cystic epithelioma, 155
Agranulocytosis: See Angina, agranulocytic
Ainhum, iodide therapy for relief of pain, *508
  pathologic histology of, 862
Albuminuria in syphilis, 267
Alexander, E. R.: Iodide therapy for relief of pain in ainhum, *508
  Superficial pustular folliculitis of new-born, *257
Allergy: See Anaphylaxis and Allergy
Allonal, eruption due to alurate, 109
Alopecia areata, etiology of, 449
  cicatrisata, case for diagnosis, 159
Alpers, B. J.: Postencephalitic trophic ulcer, *837
Alurate, experimental aspect of fixed eruption due to alurate: component of allonal, 109
American Board of Dermatology and Syphilology, candidate's impression of examination, *439
  meeting, 264, 709
American Medical Association, notice about program, 709
Amshel, F.: Mycosis fungoides, 456
Amyloidosis (localized lichen) of skin, 286
Anaphylaxis and Allergy; case for diagnosis (allergic dermatitis?), 138
  lichen spinulosus and follicular hypersensitivity in folliculitis atrophicans sycosiformis capillitii, 714
  psoriasis as allergic condition, 580
  relation of allergy to immunity in tuberculosis, 443
  sensitization dermatitis on legs due to plaster-of-paris cast, 120
Anderson, L. E.: Neurocutaneous syndrome, congenital ectodermoses, *211
Anderson, N. P.: Case for diagnosis, 726, 731
  Cutaneous manifestations of arsenic poisoning, *33
  Rosacea complex and Demodex folliculorum, 572
  Telangiectasis of feet, 730
Andrews, G. C.: Lupus erythematosus, 158
  Lymphoblastoma? 318
  Lymphoblastoma of scalp, 601
  Psoriasis of nails, 148
Anetodermia: See Atrophy, skin
Aneurym of right innominate artery; tertiary syphilis, 723; correction, 913
Angina, agranulocytic; hemorrhagic agranulocytosis, 861
  agranulocytic; report of case of acute pemphigus occurring in granulocytopenia, *704
Angiofibrosarcoma, hemangioma cavernosum of ear; angiofibrosarcoma (?) of neck, 283
Angioma, hemolymphangioma of skin with leiomyoma of deep portions of derma and cavernous angioma, portions of which are becoming sclerosed and calcified, 869
  keratotic, 283
  of brain with cutaneous nevi (neurocutaneous syndrome), *211
Anus, tuberculosis cutis (orificialis), 122
Apparatus, centering and measuring device for roentgen therapy, *570
Argyria; Argyrosis: See under Silver
Arsenic, clinical arsenical myelitis and neuritis due to acetarsone, report of 2 cases and 1 death, 855
  parakeratosis variegata with changes due to, 296
  passage through human placenta following arsphenamine therapy, 268
  pigmentation, 314, 316
  poisoning and scleroderma, 727
  poisoning, cutaneous manifestations, *33
Arsphenamine: See also under Syphilis
  angioneurotic symptom complex during treatment with arsphenamine, 586
  arsenoxide in relation to toxicity and therapeutic activity of arsphenamine and neoarsphenamine, 442
  clinical spectroscopy; study of biopsy material from patients who had received intravenous injections of silver arsphenamine, *433
  dermatitis, 132
  dermatitis, attempted sensitization to neoarsphenamine and observations on patch test, *672
  dermatitis resembling pityriasis rosea, *415
  dermatitis, vitiligo following, 871
  eruptions, etiology, therapy and prophylaxis, 446
  passage of arsenic through human placenta following arsphenamine therapy, 268
  polyneuritis following neoarsphenamine therapy, report of case with associated exfoliative dermatitis, *251
  rare manifestation of sensitivity to neoarsphenamine, 581

Arteries, coronary; syphilis of heart, coronary ostia and coronary arteries with reference to clinical picture presented by syphilitic stenosis of coronary ostia, 577
coronary; syphilis of heart, coronary ostia and coronary arteries with reference to myocardial lesions noted in stenosis of coronary ostia, 577
Arthritis, psoriasis of palms and soles following attack of arthritis, 906
psoriatic erythroderma with arthritic changes, 310
Asters, skin diseases due to plants with reference to meadow dermatitis (Wiesendermatitis), 445
Astrachan, G. D.: Lupus vulgaris, 466
Ataxia: See Tabes
Atrophoderma: See Atrophy
Atrophy, idiopathic atrophy with poikiloderma-like changes or mycosis fungoides, 287
skin; atrophy of skin, acrodermatitis chronica atrophicans and its relation to scleroderma, 276
Avitaminosis: See under Vitamins
Ayres, S., Jr.: Cutaneous manifestations of arsenic poisoning, *33
Granuloma of undetermined etiology cured by maggot therapy, 728
"Rosacea complex and Demodex folliculorum," 572
Scleroderma and chronic arsenic poisoning, 727

Bacillus crassus, demonstration in lesions in mouth in ulcus vulvae acutum, 444
Balanitx: See under Penis
Baldness: See Alopecia
Bancroft, I. R.: Fordyce's disease with cheilitis glandularis, 154
Barker, L. P.: Value of organic luetin in diagnosis and treatment of syphilis, study of 900 cases, *676
Barthel, E. A.: Parapsoriasis varioliformis acuta, 152
Bechet, P. E.: Eczematoid dermatitis or mycosis fungoides, 165
Granuloma annulare with unusual features, 879
Louis Adolphus Duhring, great American dermatologist, *369
Multiple disseminate pigmented nevi, 879
Pemphigus vegetans? 159
Poikiloderma atrophicans vasculare, 170
Becker, S. W.: Eczematoid psoriasis, 135
Keratotic angioma, 283
Melanosis, postinflammatory, following bites by Cimex lectularius or urticaria pigmentosa, 756
Mycosis fungoides, 296
Origin and nature of pigmented nevi (schwannomas), *779
Parakeratosis variegated? 755
pityriasis lichenoides acuta? 472
Bedbug: See Cimex lectularius
Beerman, H.: Arsphenamine dermatitis, 132
Juvenile paresis, 482
Beeson, B. B.: Camille Melchior Gibert, *101
Erythema, bullous multiform, 754
Pityriasis rubra, 754
Benham, R. W.: Fungi of blastomycosis and coccidioidal granuloma, *385
Benjamin, H.: Keratosis follicularis, 329
Biddle, A. P.: Lupus erythematosus, 162
Binkley, G. W.: Pseudocolloid milium, 724

Biographies:
Duhring, Louis Adolphus, *369
Gibert, Camille Melchior, *101

Biopsy material, clinical spectroscopy, a study of biopsy material from patients who had received intravenous injections of silver arsphenamine, *433
Bismuth: See also under Syphilis
fixed eruption due to, 306
Bismuth—Continued
hemorrhagic and ulceromembranous cervicovaginitis with accompanying stomatitis in course of bismuth therapy, 109
in urine, modified method for quantitative determination, 863
melanosis of colon due to, 860
therapy compared with acetarsone treatment of congenital syphilis, 856
Bites, postinflammatory melanosis following bites by Cimex lectularius or urticaria pigmentosa? 756
Bladder, syphilis, 448
Blastomycosis, fungi of blastomycosis and coccidioidal granuloma, *385
Blepharitis: See Eyelids
Blood, alkali reserve in some cases of dermatosis with regard to seasonal variations, 114
cholesterol, demonstration of, 445
fluctuation of sugar content in serum of syphilitic patients, 115
transfusion, syphilis due to, 480
Bones, syphilis, congenital, 579

Book Reviews:
Common Diseases of Skin; C. Low, 172
Diseases of Skin: Handbook of Dermatology for Practitioners and Students; S. E. Dore and J. L. Franklin, 913
Handbuch der Haut und Geschlechtskrankheiten; J. Jadassohn. Volume XII: Part 1: Tropische Dermatosen, juxtaartikuläre Knoten. Rattenbisskrankheit, 607. Volume XII, Part 2: Geschwülste der Haut, 607
Lehrbuch und Atlas der Haut- und Geschlechtskrankheiten, für praktische Arzte und Studierende; K. W. F. Zieler and E. Jacobi, 485
Lépre; E. Jeanselme, 331
Merck Manual of Therapeutics and Materia Medica, 607
Modern Treatment of Syphilis; J. E. Moore, 330
1933 Year Book of Dermatology and Syphilology; edited by F. Wise and M. B. Sulzberger, 172
Traité de la syphilis: Volume V; E. Jeanselme, 331
Wilhelm Conrad Roentgen and Early History of Roentgen Rays; O. Glasser with personal reminiscences by M. Boveri, 331

Books received, 333, 484
Bowen's Disease: Cancer, precancer
Breast cancer, American distribution of deaths from cancer of skin, mouth and breast, *425
Paget's disease of nipple, 162
scirrhous carcinoma of breast, 155
Brock, W. G.: Dermatomyositis and diffuse scleroderma, differential diagnosis and reports of cases, *227
Bromberg, W.: Psychologic motives in tattooing, 888
Burns, cigarette, tylositas symmetrica due to, 580
symmetrical squamous cell carcinoma in scars of burns on legs, 714
Butterworth, T.: Acanthosis nigricans, 124

Calcification; calcinosis universalis and dermatomyositis, 858
of skin in diabetes mellitus, 267
Cancer: See also Adenoma; Sarcoma; Tumor; etc.
American distribution of deaths from cancer of skin, mouth and breast, *425
carcinomatous metastases in skin resembling hemolymphangioma, 444
facial characteristics of, 863
generalized carcinomatosis, 725
gumma of tongue with carcinomatous degeneration, 464
precancer; Bowen's disease, 112, 319

Cancer—Continued
report on case diagnosed as squamous cell carcinoma on chin at Dec. 19, 1933, meeting, 170
symmetrical squamous cell carcinoma in scars of burns on legs, 714
Canities: See Hair
Cannon, A. B.: Atrophic ulcer in scar tissue of nose, 902
Chancroid, 600
Erythema multiforme, 872
Late secondary syphilis, 596
Lupus vulgaris; acquired hypospadias, 601
Psoriasis of palms and soles following attack of arthritis, 906
Syphilis with Charcot's knee joint, 600
Tuberculosis or granuloma inguinale, 597
Vitiligo following arsphenamine dermatitis, 871
Capillaroscopy; capillary microscopy in erythema nodosum, 860
cutaneous circulation in light of high magnification capillaroscopy, 444
Carbohydrate metabolism, dextrose and water content of normal and of inflamed skin, *489
Caro, M. R.: Melanoma, 297
Necrobiosis lipoidica diabeticorum, 299, *796
Tuberculosis verrucosa cutis, 476
Carpenter, C. C.: Dermatitis produced by hymoial salts (new soaplike material), *517
Carrion's Disease: See Oroya fever
Cerebrospinal fluid, efficiency of gold sol and mastic tests in syphilitic conditions, 444
Chambers, S. O.: Darier-Roussy's sarcoid, 731
Lupus erythematosus, 732
Chancre, cervix of uterus, 578
hard chancre of bulbar conjunctiva, 713
healed, with acquired hypospadia: lupus vulgaris, 601
Chancroid, 600
Charcot's Joint: See Tabes
Chargin, L.: Erythema perstans, 459
Lymphogranuloma or sarcoid? 310
Psoriatic erythroderma with arthritic changes, 310
Syphilitic infiltration of face simulating lupus erythematosus, 735
Cheilitis: See Lips
Chickenpox, early sign of infection with, 110
relationship between varicella and herpes zoster, 860
Chilblain: See Pernio
Cholesterol in Blood: See Blood
Chorioretinitis: See Retinochoroiditis
Chrysanthemums, skin diseases due to plants with reference to meadow dermatitis (Wiesendermatitis), 445
Cicatrix, atrophic ulcer in scar tissue of nose, 902
symmetrical squamous cell carcinoma in scars of burns on legs, 714
Cigarette burns, tylositas symmetrica due to, 580
Cimex lectularius, postinflammatory melanosis following bites by Cimex lectularius or urticaria pigmentosa? 756
Cinnamon, dermatitis from cinnamon or dermatomycosis, 152
Cipollaro, A. C.: Roentgen unit in dermatology, *761
Coccidioidal Granuloma: See Coccidiosis
Coccidiosis, coccidioidal granuloma, 730
fungi of blastomycosis and coccidioidal granuloma, *385
Cod liver oil, sensitivity in children, 441
Cohen, M. H.: Cutaneous diphtheria in congenital syphilis, report of case, *207
Colon, melanosis of colon due to bismuth, 860
Combes, F. C.: Sarcoid or leprosy, 312
Tuberculosis of hypoderm (Darier-Roussy sarcoid), 593
Conjunctiva, hard chancre of bulbar conjunctiva, 713
syphilitic disease, 272
Connor, W. H.: Extragenital syphilis in child 3 years old, 726
Generalized carcinomatosis, 725
Heredosyphilis, involvement of central nervous system, 720
Hypertrichosis following impetigo, 721
Lymphogranuloma inguinale, 724
Tertiary syphilis; aneurysm of right innominate artery, 723; correction, 913
Tertiary syphilis, gummas of skin, hepatitis, splenomegalia, hemiplegia and osteitis of right humerus, 719
Cormia, F. E.: Autolysate therapy for verruca vulgaris, *44
Dermatitis herpertiformis, 131
Infantile acne, 134
Cornbleet, T.: Argyria, 297
Dermatitis exfoliativa neonatorum (Leiner's disease), 298
Hemangiomas in lipomatosis, 142
Keratoderma blennorrhagicum, 291, 757
Leprosy, 141
Tularemia or sporotrichosis, 299
Urinary proteose in eczema, *497
Cornea, chemical method of corneal tattooing for production of brown color, 271
Inflammation: See Keratitis
Counseller, V. S.: Kraurosis, leukoplakia and pruritus vulvae; correlation of clinical and pathologic observations with studies regarding resection of sensory nerve of perineum, *80
Cowpox, epidemiology and etiology of milker's nodules, 277
Craig, W. M.: Kraurosis, leukoplakia and pruritus vulvae; correlation of clinical and pathologic observations with studies regarding resection of sensory nerves of perineum, *80
Crawford, S.: Branchial fistula, 453
Melanoma, 457
Cream, new cleansing cream, *243
Curth, H. O.: Dermatofibrosis lenticularis disseminata and osteopoikilosis, *552
Cutis Verticis: See Scalp
Cysts, circinate arrangement of epithelial cysts following impetigo contagiosa, 714

Danlos syndrome associated with congenital lipomatosis, *540
Darier's Disease: See Keratosis follicularis
Dementia Paralytica: See Paralysis, general
Demodex folliculorum and acne rosacea, 854
folliculorum and rosacea complex, 572
Dennie, C. C.: Treatment of resistant somatic syphilis, *1
Depigmentation: See Pigmentation
Dermatitis: See also Acrodermatitis
allergic, 138
artefacta, 603
Atrophicans: See Atrophy
chronic dermatitis simulating leprosy, 899
dermatite lichénoide purpurique et pigmentée of Gougerot and Blum, or Schamberg's progressive pigmentary dermatosis, 873
exfoliativa neonatorum (Leiner's disease), 298
factitia, 317
factitia and stomatitis, 452
factitia, psychogenesis, 882
Herpetiformis: See Dermatitis multiformis
Medicamentosa: See under Allonal; Arsenic; Arsphenamine; Atropine; Bismuth; Ephedrine; Ergosterol; Gold; Hymoial; Phenolphthalein; Potassium; Sulphur; etc.
multiformis, 128, 131, 305
multiformis and epithelioma, 602
multiformis, case for diagnosis, 908
multiformis, earliest stages, 907
multiformis in syphilitic patient, 753
multiformis; treatment of pemphigus vulgaris and pemphigus chronicus recidivans (morbus Duhring) with Bayer 205, 450
mycotic, of hands and feet with contact dermatitis due to sulphur, 120
vegetans, 874

Dermatitis—Continued
Venenata: See also under names of substances as Gold; Nickel; Soaps; Tar; Thallium; etc.
venenata, aid in management of occupational contact dermatitis (dermatitis venenata), *30
venenata from cinnamon or dermatomycosis, 152
venenata from Rhus toxidodendron, report of unusual cases, *645
venenata sensitization dermatitis on legs due to plaster-of-paris cast, 120
venenata; silk handlers' disease of skin, 586
venenata skin diseases due to plants with reference to meadow dermatitis (Wiesendermatitis), 445
Dermatofibroma: See Fibroma
Dermatoleiomyoma, solitary, 113
Dermatologic societies, directory of, 174, 334, 486, 608, 758, 914
Dermatology, early nineteenth century dermatology and brothers Mahon, *245
examination; dermatologic examination: candidate's impression, *439
recent changes in dermatologic diagnosis, résumé of 1,112,050 published cases, *260
Dermatolysis: See Atrophy, skin
Dermatomycosis: See Mycosis
Dermatomyositis and calcinosis universalis, 858
and diffuse scleroderma, differential diagnosis and reports of cases, *227
Dermatophytes: See under Fungi; Trichophyton
Dermatophytosis: See Mycosis
Dermatosis: See Dermatitis; Eczema; Skin diseases: etc.
Dermo-epidermite, miliary, pustulosquamous dermo-epidermite in progressing centrifugal plaques (Gougerot's disease), 144, 308
Devergie's Disease: See Pityriasis rubra
Dextrose and water content of normal and of inflamed skin, *489
Diabetes, bilateral thrombosis of superior labial arteries with gangrene in diabetic patient, 480
calcification of skin in, 267
necrobiosis lipoidica diabeticorum, *796, 897, 898
Diagnosis, recent changes in dermatologic diagnosis, résumé of 1,112,050 published cases, *260
Diasio, F. A.: Pachyonychia congenita Jadassohn, variety of ichthyosis (pachyonychia ichthyosiformis) involving chiefly nails, *218
Diathermy: See under names of various diseases
Diphtheria, cutaneous, in congenital syphilis, report of case, *207
Directory of dermatologic societies, 174, 334, 486, 608, 758, 914
Disinfection, self-disinfecting power of skin, 576
Dorne, M.: Esthiomene, late manifestation of lymphopathia venerea (lymphogranulomatosis inguinalis), *831
Downing, J. G.: Case for diagnosis, 325
Multiple benign sarcoid of skin, 327
New cleansing cream, *243
Drug Eruptions: See under names of drugs, as Allonal; Arsenic; Arsphenamine; Atropine; Gold; Phenolphthalein; etc.
Duhring, Louis, Adolphus, great American dermatologist, *369
Duhring's Disease: See Dermatitis multiformis
Durand-Nicolas-Favre Disease: See Lymphogranuloma inguinale
Dyshidrosis: See under Sweat and Sweat Glands
Dyskeratosis: See Keratosis

Ear, epithelioma (basal cell) of ear of Ngress, 478
hemangioma cavernosum of ear; angiofibrosarcoma of neck, 283
psoriasis of tympanic membrane, 274
Ebert, M. H.: Erythema bullous multiform, 754
Myxedema, localized, 478
Ebert, M. H.—Continued
Nevi multiple, 292
Parapsoriasis lichenoides, 291
Pityriasis rubra, 754
Vulvitis (ulcerative) and stomatitis, 472
Ectodermal defect, 289
Ectodermoses, congenital; neurocutaneous syndrome, *211
Eczema due to food, 120
eczematoid dermatitis or mycosis fungoides? 165
infantile, cause of death in, 858
infantile, simplifying problem of, analysis of 157 cases, 858
of infancy and childhood; contacts as etiologic agent with reference to feathers, 265
seborrheic, and parakeratotic diathesis, 449
urinary proteose in, *497
vaccinatum, 856
Electrocoagulation: See under names of various diseases
Electropyrexia: See Fever therapeutic
Elephantiasis, late nodular ulcerative syphilid of arm and hand associated with elephantiasis of lower lip, 720
of upper lip; fibrosis (papular) of palate, 294
Eller, J. J.: Dermatomycosis, 905
Duhring's disease, 908
Tuberculosis of hypoderm, 751
Xeroderma pigmentosum, 751
Ellis, F. A.: Multiple idiopathic hemorrhagic sarcoma of Kaposi, report of case in American Negro, *706
Emmons, C. W.: Dermatophytes, natural grouping based on form of spores and accessory organs, *337
Encephalitis, postencephalitic trophic ulcer, *837
Endocarditis, hemorrhagic eruption of mouth and throat in rheumatic state, 266
Endocrine glands, clinical investigation and pathologic histology of endocrine glands in scleroderma, 581
Epidermolysis bullosa acquisita; successful treatment with iron cacodylate, blood coagulant, calcium (with phosphorus) and roentgen rays, *537
Epidermomycosis: See Mycosis
Epidermophytids; Epidermophyton: See Mycosis
Epidermophytosis: See Mycosis
Epithelioma and dermatitis herpetiformis, 602
basal cell, of ear of Negress, 478
calcified, of skin, 710
extensive flat epithelioma of cheek, 912
factitious ulcer of lip simulating epithelioma, 126
multiple, benign, cystic, 119
of penis, 160
sebaceous adenoma or benign cystic epithelioma, 155
superficial flat epithelioma of skin, 159
visceral metastases of cutaneous metatypical epitheliomas, 276
Epstein, N. N.: Polyneuritis following neoarsphenamine therapy, report of case with associated exfoliative dermatitis, *251
Erythema bullous multiform, 754
hyperpigmentation and depigmentation following recurrent erythema multiforme-like eruptions, 315
induratum, 129, 455
induratum, streptococci, 454
multiforme, 872
nodosum and tuberculosis, 265
nodosum, capillary microscopy in, 860
nodosum, clinical and epidemiologic significance in children, 583
nodosum, tuberculous etiology of, 449
of psychogenic or angioneurotic origin, 882
perstans, 459
toxicum following use of resinol ointment, 750
Erythrodermia desquamativa, 858
malignant; aleukemic leukemia (lymphatic), 278
psoriatic, with arthritic changes, 310
universal erythrodermia with lichenification? 288

Erythroplasia of glans penis (Queyrat), *647
of Queyrat? 594
Esthiomene, late manifestation of lymphopathia venerea (lymphogranulomatosis inguinalis), *831
Excoriations, neurotic, 882
Eye, complications of acne rosacea, 271
polymorphous hereditary syphilitic lesions of eye observed in 3 brothers, 110
Eyelids, autovaccine in ulcerous blepharitis, 717
gumma of lower lid, 274

Face cancer, characteristics of, 863
Fat, Danlos syndrome associated with congenital lipomatosis, *540
Feathers, etiologic agents in eczema of infancy and childhood, 265
Feet: See Foot
Feit, H.: Acne varioliformis treated with intradermal injections of bacteriophage, 151
Psoriasis of mucocutaneous surface and vermilion of lips, 599
Feldman, S.: Arsphenamine dermatitis resembling pityriasis rosea, *415
Gumma of upper lip, 461
Juxta-articular nodes, 739
Kaposi's sarcoma, 462
Lupus erythematosus disseminatus, 743
Pityriasis rubra pilaris, 460
Septic ulcer of groin, 738
Tertiary syphilis, 465
Ferment production, diseases resulting from disturbance of ferment production (ferment diseases and ferment therapy), 714
Fever, therapeutic; physiology of electropyrexia, 441
Fiala, M. J.: Acute pemphigus, report of case occurring in granulocytopenia, *704
Fibroma; dermatofibroma, 111
dermatofibroma lenticulare (Schreus), 273
dermatofibroma lenticularis disseminata and osteopoikilosis, *552
papular fibrosis of palate; elephantiasis of upper lip, 294
sarcomatoid fibroma of skin (progressive and recurring dermatofibroma), 108
Filariasis in some areas in India, Gwalior State area, 444
Film, protective, for use in dermatitis venenata, *30
Finnerud, C. W.: Malignant erythroderma; aleukemic lymphatic leukemia, 278
Fisher, A.: Superficial intra-oral application of roentgen rays, *793
Fisher, J. W.: Onychauxis, 452
Fistula, branchial, 453
Fluorescence of elastic fibers of skin, 445
Foerster, O. H.: Pseudoxanthoma elasticum and associated purpura with angioid streaks, 280
Folliculitis, atrophicans sycosiformis capillitii, lichen spinulosus and follicular hypersensitivity in, 714
decalvans, 454
follicular lesions in vitamin A and C deficiencies, *177
superficial, pustular, of new-born, *257
Foot, case of dyshydrotic, superficial cutaneous actinomycosis of palms and soles, 580
Fordyce's Disease: See Fox-Fordyce Disease
Fox, H.: American leishmaniasis, further observations, *241
Dermatitis factitia, 317
Extensive pemphigoid eruption in infant, 588
Flat papular syphilid with unusual coalescence, 879
Generalized lupus vulgaris in syphilitic patient, 321
Generalized progressive scleroderma, 747
Lupus miliaris disseminatus faciei, 878
Lupus vulgaris of nose and multiple sarcoid of arms, 911
Multiple giant cell sarcoma, 745
Multiple giant cell sarcoma of epulis type, 865
Onychomycosis affecting all nails of fingers and toes, 747
Pemphigoid eruption in infant, 750
Fox, H.—Continued
Sarcoma of Kaposi in woman, 748
Serpiginous ulcerating pyodermia (pyodermia gangrenosa), 875
Fox-Fordyce Disease, 317
Fordyce's disease with cheilitis glandularis, 154
Frambesia, clinical study of periostitis and ostitis in early stage of frambesia, 585
experimental; comparison of infection with experimental syphilis, 268
experimental, in mice; Spirochaeta pallida in iliac lymph glands, 585
Fraser, J. F.: Paget's disease of nipple, 162
Psoriasis, 870
Roentgen ray dermatitis, 901
Freckles, apparatus for treating freckles (ephelides), 112
Frei test, lymphogranuloma inguinale; preservation of Frei antigen by drying; its concentration in fresh and in dried pus, *823
Friedman, H. L.: Centering and measuring device for roentgen therapy, *570
Fungi: See also Actinomycosis; Blastomycosis; Moniliasis; Mycosis; etc.
histologic demonstration of Schizosaccharomyces hominis in umbilical cord, 445
natural grouping of dermatophytes, based on form of spores and accessory organs, *337
serologic reactions of cultures of Monilia and of some other yeastlike fungi, 858

Gammel, J. A.: Periadenitis mucosa necrotica recurrens, 725
Pseudocolloid milium, 724
Gangrene, heat, desiccation and oxygen in local treatment of advanced peripheral vascular disease, 576
hysterical, 882
thrombosis, bilateral, of superior labial arteries with gangrene in diabetic patient, 480
Garfield, W. T.: Lupus erythematosus disseminatus acutus haemorrhagicus, *772
Garner, V. C.: Circumscribed plaquelike type of myxedema, 133
Transfusion syphilis, 480
Gaul, L. E.: Clinical spectroscopy, quantitative retention of nickel in psoriasis; observations on 46 cases, *697
Clinical spectroscopy, study of biopsy material from patients who had received intravenous injections of silver arsphenamine, *433
Gilman, R. L.: Acute pemphigus, 125
Dermatitis herpetiformis, 128
Mycosis fungoides, 123
Syphilis, 123
Tuberculid, 129
Tuberculosis cutis (orificialis), 122
Glossitis: See under Tongue
Glycogen and metabolism of sugar in skin, 447
Goiter, bilateral myxedema of lower parts of legs following operation for exophthalmic goiter, 313
myxedema circumscriptum tuberosum planum symmetricum crurum in exophthalmic goiter, 580
Gold: See also under names of various diseases
compound, chemotherapeutic usefulness of gold compound containing derivative of natural sulphur albuminoid, 716
intoxication, severe, despite small doses; cutaneous manifestations and blood changes, 579
lupus erythematosus (telangiectatic type) or dermatitis medicamentosa (gold), 322
therapy in dermatology and demonstration of gold in organs, 862
therapy, lichen ruber planus as an isomorphic effect of irritation from gold therapy, 580
Goldmann, B. A.: Erythema induratum (streptococcic), 454
Goldstein's Disease: See Telangiectasia
Goodman, H.: Hydrogen ion concentration of lotions used in treatment of acne, *6
Parapsoriasis varioliformis acuta, 152
Goodman, J., Jr.: Verrucae, a review, *659
Gougerot-Blum syndrome, 873

Gougerot's disease; miliary pustulosquamous dermo-epidermite in progressing centrifugal plaques (Gougerot's disease), 308
Grace, A. W.: Lymphogranuloma inguinale; preservation of Frei antigen by drying; its concentration in fresh and in dried pus, *823
Pemphigus, evidence in support of bacteremia as explanation of certain terminal changes in blood picture, *22
Granulocytopenia: See Angina, agranulocytic
Granuloma annulare, 467, 481
annulare or sarcoid, 867
annulare, report of unusual case, *785
annulare with unusual features, 879
Coccidioidal: See Coccidiosis
cystic acne or tuberculous granuloma? 162
inguinale or tuberculosis, 597
of undetermined etiology cured by maggot therapy, 728
or lichen nitidus, 865
Grauer, F. H.: Granuloma annulare, report of unusual case, *785
Greenbaum, S. S.: Factitious ulcer of lip (simulating epithelioma), 126
Postencephalitis trophic ulcer, *837
Greenwood, A. M.: Lichen planus atrophicus, 325
Verrucae, a review, *659
Gross, P.: Disseminated miliary lupus of face, 738
Lupus erythematosus of mucous membrane of mouth, 462
Morphea with xanthomatous infiltration, 598
Multiple idiopathic hemorrhagic sarcoma (Kaposi) with lesions in mouth, 153
Parapsoriasis en plaques (Brocq), 738
Gumma of lower lid, 274
of tongue with carcinomatous degeneration? 464
of upper lip, 461
tertiary syphilis, gummas of skin, hepatitis, splenomegalia, hemiplegia and osteitis of right humerus, 719
Gums, hypertrophy, 862
Guy, W. H.: Mycosis fungoides, 456

Haberman's Disease: See Pityriasis lichenoides varioliformis et acuta
Hair glands, acneform responses to patch tests; follicular and papulopustular reactions to selectivity pilosebaceous irritants, *566
plica neuropathica, 301
superfluous, following impetigo, 721
trichotillomania, case for diagnosis, 326
Hall, T. B.: Neurosyphilid of Unna as manifestation of congenital syphilis; forme fruste of late cutaneous syphilis, *561
Hands, case of dyshydrotic, superficial cutaneous actinomycosis of palms and soles, 580
protective film for use in dermatitis venenata, *30
Hansen's Disease: See Leprosy
Heart, syphilis of heart, coronary ostia and coronary arteries with reference to clinical picture presented by syphilitic stenosis of coronary ostia, 577
syphilis of heart, coronary ostia and coronary arteries with reference to myocardial lesions noted in stenosis of coronary ostia, 577
Hemangioma cavernosum of ear; angiofibrosarcoma of neck, 283
in lipomatosis, 142
Hemiplegia, tertiary syphilis, gummas of skin, hepatitis, splenomegalia, hemiplegia and osteitis of right humerus, 719
Hemolymphangioma, carcinomatous metastases in skin resembling hemolymphangioma, 444
of skin with leiomyoma of deep portion of derma and cavernous angioma, portions of which are becoming sclerosed and calcified, 869
Hemorrhagic diathesis, sudden onset after treatment with Sulphotreparsenan, 447
Herpes, experimental herpetic folliculitis; percutaneous inoculation with herpes and problem of natural tissue infection, 582
Herpes—Continued
experiments on resistance of virus of herpes, 861
gestationis, 736
recurring, treatment of, 446
zoster relationship between varicella and herpes, 860
Hinton, W. A.: Hinton test and lumbar puncture in treated primary and secondary syphilis, *813
Hinton Test: See Syphilis
Hirsutism: See under Hair
Hodgkin's Disease: See Lymphogranuloma
Hollander, L.: Melanoma with carcinomatous nodules, 457
Onychauxis, 452
Stomatitis and dermatitis factitia, 452
Superficial intra-oral application of roentgen rays, *793
Hopkins, J. G.: Hypertrophic lichen planus, 909
Lupus erythematosus or lichen planus hypertrophicus, 870
Moniliasis, 876
Houghton, J. D.: Lupus erythematosus disseminatus acutus haemorrhagicus, *772
House tick bite, 113
Hu, C. K.: High pathogenicity of recently isolated strain of Spirochaeta pallida, *847
Hydrogen ion concentration of lotions used in treatment of acne, *6
Hymolal salts, dermatitis produced by hymolal salts (new soaplike material), *517
Hyperglycemia: See Blood, sugar
Hyperhidrosis: See under Sweat and Sweat Glands
Hyperpyrexia: See under Fever
Hyperthyroidism: See Goiter; Thyroid
Hypertrichosis: See Hair, superfluous

Ichthyosis, pachyonychia congenita Jadassohn, variety of ichthyosis (pachyonychia ichthyosiformis) involving chiefly nails, *218
Icterus: See Jaundice
Impetigo contagiosa, circinate arrangement of epithelial cysts following impetigo contagiosa, 714
contagiosa, new auxiliary treatment, 856
hypertrichosis following impetigo, 721
Industrial Diseases; silk handlers' disease of skin, 586
Infant, New-Born, experimental cutaneous indurations in new-born, 712
superficial pustular folliculitis of new-born, *257
Infections, influence of vitamins on acute infections, 860
Inflammation, dextrose and water content of normal and of inflamed skin, *489
International Congress of Dermatology and Syphilology, ninth, 484
Intestine, rhinoscleroma, 274
Iodide eruption, erythema nodosum type, 477
therapy for relief of pain in ainhum, report of case, *508
Iodobismitol: See Bismuth
Irgang, S.: Iodide therapy for relief of pain in ainhum, report of case, *508
Superficial pustular folliculitis of new-born, *257
Irvine, H. G.: Tuberculous lesions of skin with active foci, 900
Ivy Poisoning: See Rhus poisoning

Jacobson, H. P.: Case for diagnosis, 733
Coccidioidal granuloma, 730
James, A. P. R.: Aid in management of occupational contact dermatitis, *30
Jamieson, R. C.: Cystic acne or tuberculous granuloma? 62
Jaundice, in syphilis, 441
Juxta-articular nodes, 739

Kahn Reaction: See Syphilis
Kala-Azar: See Leishmaniasis
Kaplan, M. A.: Urinary proteose in eczema, *497

Kaposi's Disease: See Xeroderma pigmentosum
Varicelliform Eruption: See Pyodermia
Keil, H.: Follicular lesions in vitamin A and C deficiencies, *177
Kelley, E.: Pigmentation due to arsenic? 316
Kellogg, F.: Polyneuritis following neoarsphenamine therapy, report of case with associated exfoliative dermatitis, *251
Keloids, multiple, 147
Keratitis, does treatment of congenital syphilis prevent development of interstitial keratitis; interstitial keratitis after injury, 716
metastatic keratitis parenchymatosa in syphilitic rabbits; distribution of spirochaeta pallida in early stage, 584
Keratodermia: See also Ichthyosis; Keratosis
blenorrhagicum, 291, 757
so-called keratodermia tylodes palmaris progressivum, 112
Keratoma palmare et plantare or pityriasis rubra pilaris? 460
Keratosis: See also Ichthyosis; Keratodermia
follicularis, 329
follicularis, Darier's disease with fatal radium dermatitis, *412
on lower lip in patient shown at Dec. 19, 1933, meeting, 171
symmetrical (tylositas symmetrica pollicis et indicis), 580
Kerr, J. C.: Relapse in primary syphilis, 453
King, A. D.: Lichen planus, 128
Kittredge, H. E.: Epidermolysis bullosa acquisita; successful treatment with iron cacodylate, blood coagulant, calcium (with phosphorus) and roentgen rays, *537
Klauder, J. V.: Psychogenic aspect of diseases of skin, 881
Secondary syphilis, 128
Klien, B.: Pseudoxanthoma elasticum of skin; angioid streaks of retina; old chorioretinitis, 280
Kline Precipitation Test: See Syphilis
Knee, syphilis with Charcot's knee joint, 600
Kraurosis, leukoplakia and pruritus vulvae; correlation of clinical and pathologic observations with studies regarding resection of sensory nerves of perineum, *80
Krueger, A. P.: Preparation of trichophytin, *9
Kulchar, G. V.: Dextrose and water content of normal and of inflamed skin, *489
Erythema induratum, 129
Neurocutaneous syndrome, 126
Neurocutaneous syndrome, congenital ectodermoses, *211

Lapowski, B.: Miliary, pustulosquamous dermoepidermite in progressing centrifugal plaques (Gougerot's disease), 144, 308
Lashinsky, I. M.: Arsphenamine dermatitis resembling pityriasis rosea, *415
Granuloma annulare? 467
Pityriasis lichenoides et varioliformis acuta, 737
Lawless, T. K.: Telangiectasia (hereditary, hemorrhagic), Osler's "recurring epistaxis with multiple telangiectases of skin and mucous membranes"? 295
Lawrence, J.: Dermatitis due to potassium mercuric iodide, *76
Laymon, C. W.: Tuberculoid reaction in lymph nodes, *518
Lead, pigmentation due to arsenic and lead, 314
Leiner's Disease: See Dermatitis exfoliativa neonatorum
Leiomyoma, hemolymphangioma of skin with leiomyoma of deep portion of derma and cavernous angioma, portions of which are becoming sclerosed and calcified, 869
solitary dermatoleiomyoma, 113
Leishmaniasis, American, *241
cutaneous, report of 2 cases, *401
studies in dermal leishmanoid, 271
viable Leishmania Donovani in nasal and oral secretions of patients with kala-azar and bearing of this finding on transmission of disease, 711

LeMoine, M.: Value of Kline precipitation test for detection of syphilis in applicants for life insurance, *190
Lentigo: See Freckles; Nevus
Leprosy, 141
chronic dermatitis simulating leprosy, 899
in Austria, 585
or sarcoid, 312
sweat gland functioning in spots of, 275
Lerner, C.: Recklinghausen's disease in 4 members of 1 family, 743
Leukemia, malignant aleukemic lymphatic leukemia, 278
Leukoderma: See Vitiligo
Leukokeratosis: See Keratosis
Leukomelanoderma: See Pigmentation
Leukoplakia, 323, 604
kraurosis, leukoplakia and pruritus vulvae; correlation of clinical and pathologic observations with studies regarding resection of sensory nerves of perineum, *80
Lewis, G. M.: Bowen's precancerous dermatosis, 319
Lichen nitidus, 448
nitidus or granuloma, 865
nitidus, report of generalized case, *790
planus, 128
planus and vitiligo (lesions appearing in patches of vitiligo), 122
planus atrophicus, 325
planus erythematosus, 899
planus, follicular, 899
planus, hypertrophic, 909
planus hypertrophicus or lupus erythematosus, 870
planus of mouth only, 152
planus, vesicular and bullous lichen planus, 450
ruber planus as an isomorphic effect of irritation from gold therapy, 580
spinulosus and follicular hypersensitivity in folliculitis atrophicans sycosiformis capillitii, 714
Urticatus: See Urticaria papulosa
Lightning, cutaneous changes resulting from lightning, 273
Lindsay, H. C. L.: Case for diagnosis, 732
Lingua: See Tongue
Lipoid imbition of degenerate elastic tissue, 586
Lipoma, hemangiomas in lipomatosis, 142
Lipomatosis: See under Fat
Lips, cheilitis exfoliativa, 910
elephantiasis of lower lip with late nodular ulcerative syphilid of arm and hand, 720
elephantiasis of upper lip; papular fibrosis of palate, 294
factitious ulcer of lip simulating epithelioma, 126
Fordyce's disease with cheilitis glandularis, 154
gumma of upper lip, 461
keratosis on lower lip in patient shown at Dec. 19, 1933, meeting, 171
psoriasis of mucocutaneous surface and vermilion of lips, 599
Liver, tertiary syphilis, gummas of skin, hepatitis, splenomegalia, hemiplegia and osteitis of right humerus, 719
Lotions, hydrogen ion concentration of lotions used in acne, *6
Luetin Test: See under Syphilis
Lumbar Puncture: See Spinal Puncture
Lung, syphilis, tertiary, 863
Lupoid: See Sarcoid
Lupus: See also Tuberculosis
disseminated miliary lupus of face, 738
erythematosus, 158, 162, 732
erythematosus, acute, 140
erythematosus acutus disseminatus simulating scarlet fever, 900
erythematosus, disseminated, with pernio, 145
erythematosus disseminatus, 743
erythematosus disseminatus acutus haemorrhagicus, *772
erythematosus in colored person, 308
erythematosus of mucous membrane of mouth, 462, 463

Lupus—Continued
erythematosus or lichen planus hypertrophicus, 870
erythematosus, syphilitic infiltration of face simulating lupus erythematosus, 735
erythematosus (telangiectatic type) or dermatitis medicamentosa (gold), 32
erythematosus verrucosus, 904
erythematosus with bullous lesions, 752
miliaris disseminatus faciei, 137, 290, 878
pernio (Besnier), 150
pernio, therapeutic experience with pilocarpine in, 583
roentgen therapy, 714
sarcoma in lesions of, 580
vulgaris, 466
vulgaris and acquired hypospadias, 601
vulgaris, calcification of giant cells in, 714
vulgaris, combined treatment with grenz rays and diet, 445
vulgaris, generalized, in syphilitic patient, 321
vulgaris of nose and multiple sarcoid of arms, 911
Lymph Nodes, experimental yaws in mice; spirochaeta pallida in iliac lymph glands, 585
osteitis tuberculosa multiplex cystica with sarcoid and involvement of hilar nodes, 583
periadenitis mucosa necrotica recurrens, 725
spirochetes in lymph glands of syphilitic rabbits; fluctuation in spirochete content of spleen, 584
spirochetes in spleen and lymph glands of syphilitic rabbits after insufficient treatment with salvarsan, 275
tuberculoid reaction in, *518
Lymphangioma, cavernous, 733
Lymphangitis, case for diagnosis, 461
Lymphoblastoma: See also Lymphogranuloma; Mycosis
Lymphoblastoma, 278, 307, 318, 320
of scalp, 601
Lymphogranuloma: See also Granuloma
case for diagnosis, 149, 310
esthiomene, late manifestation of lymphopathia venerea (lymphogranulomatosis inguinalis), *831
esthiomene, probably lymphogranulomatosis inguinalis, 142
history, origin and distribution of lymphogranulomatosis venerea in South America, 712
inguinale, 269, 724
inguinale, preservation of Frei antigen by drying; its concentration in fresh and in dried pus, *823
inguinale, relationship of glossitis marginata to, 445
inguinale, treatment of, 581
inguinale with penile initial lesion, 161

McBride, W. L.: Treatment of resistant somatic syphilis, *1
Macdonald, W. J.: Demodex folliculorum and acne rosacea, 854
MacKee, G. M.: Case for diagnosis, 164
Psoriasis pustulosa, 161
Roentgen unit in dermatology, *761
Madden, J. F.: Case for diagnosis, 306
Cutis verticis gyrata (congenital anomaly type), 302
Dermatitis herpetiformis, 305
Lichen planus and vitiligo, 122
Lymphoblastoma (leukemia cutis), 307
Onychogryposis, 304
Psoriasis, 303
Psoriasis arthropathica, 303
Mahon brothers and early nineteenth century dermatology, *245
Majocchi's Disease: See Purpura annularis telangiectodes
Maloney, E. R.: Flat papular syphilid with unusual coalescence, 879
Lupus miliaris disseminatus faciei? 878
Nevus sebaceus linearis, 167
Serpiginous ulcerating pyodermia (pyodermia gangrenosa), 875
Meadow dermatitis, skin diseases due to plants with reference to meadow dermatitis (Wiesendermatitis), 445
Measles, influence of pigmentation due to light treatment on eruption of measles, 109
Meinicke Test: See Syphilis
Melanin Pigmentation: See Pigmentation
Melanocarcinoma, 462
Melanoderma: See Pigmentation
Melanoma, 297, 457
with carcinomatous nodules, 457
Melanosis: See Pigmentation
Melkerknoten: See Cowpox
Mercury, colloidal mercury sulphide in syphilis, *49
Metasyphilis: See Syphilis, congenital
Michelson, H. E.: Asymmetric adenoma sebaceum, 896
Chronic dermatitis simulating leprosy, 899
Disseminated miliary papular lupoid, 892
Kaposi's hemorrhagic sarcoma, 282
Lichen planus erythematosus, 899
Lichen planus (follicular), 899
Lupus erythematosus acutus disseminatus simulating scarlet fever, 900
Lupus erythematosus in colored patient, 308
Multiple benign cystic epithelioma, 119
Necrobiosis lipoidica diabeticorum, 897, 898
Pemphigus (Senear-Usher syndrome), 896
Pityriasis lichenoides acuta et varioliformis, 119
Pyodermia staphylogenes sudipora, 118
Rosacea-like tuberculid, 892
Syringoma, 896
Tuberculous ulcer (primary complex), 893
Xanthelasmatosis, 117
Milium: See Skin, colloid degeneration
Milker's Nodules: See Cowpox
Mind, Influence on Skin: See under Skin
Mitchell, J. H.: Glossitis syphilitica, 468
Kaposi's hemorrhagic sarcoma, 282, 477
Lupus erythematosus acutis, 140
Pityriasis rubra pilaris, 284
Prurigo nodularis, 470
Molds: See Fungi
Moles: See Nevus
Monilia, serologic reactions of cultures of Monilia and of some other yeastlike fungi, 858
Moniliasis, 876
generalized moniliasis and moniliids? 741
miliary pustulo-squamous dermo-epidermite in progressive centrifugal plaques, 308
Montgomery, H.: Kraurosis, leukoplakia and pruritus vulvae; correlation of clinical and pathologic observations with studies regarding resection of sensory nerves of perineum, *80
Lupus miliaris disseminatus faciei, 137
Moore, J. R.: Nevus of left shoulder, 483
Morginson, W. J.: Erythema induratum, 455
Morphea: See also Scleroderma
and scleroderma of hands, 474
case for diagnosis, 868
morphea-like tuberculosis cutis or morphea, 902
with xanthomatous infiltration, 598
Morse, J. L.: Hodgkin's disease? 149
Mossy foot, probable inclusion of several diseases in title "mossy foot," 711
Mouth: See also Angina, agranulocytic; Gums; Stomatitis; etc.
cancer, American distribution of deaths from cancer of skin, mouth and breast, *425
demonstration of Bacillus crassus in lesions in mouth in ulcus vulvae acutum, 444
lichen planus of mouth only, 152
lupus erythematosus with lesions in mouth, 462, 463
malignant syphilis with grave involvement of mucous membranes of mouth, 276
multiple idiopathic hemorrhagic sarcoma (Kaposi) with lesions in mouth, 153
superficial intra-oral application of roentgen rays, *793
ulcus vulvae acutum accompanied by disease of skin and of oral mucosa, *510

Mucha-Habermann syndrome (parapsoriasis varioliformis), *631
Mucor paronychia, *651
Mycosis: See also Actinomycosis; Blastomycosis
case for diagnosis, 905
dermatitis from cinnamon; dermatomycosis? 152
dermatomycosis and the soldier, *841
epidermophytin and epidermophytids, 582
epidermophyton lanoroseum, 111
fungoides, 123, 295, 296, 456
fungoides or eczematoid dermatitis, 165
fungoides or idiopathic atrophy with poikiloderma-like changes, 287
onychomycosis affecting all nails, 747
pigmented mycotic growth beneath nail, *186
Myelitis, clinical arsenical myelitis and neuritis due to acetarsone; report of 2 cases with 1 death; negative observations at necropsy, 855
Myocardium, syphilis of heart, coronary ostia and coronary arteries with reference to myocardial lesions noted in stenosis of coronary ostia, 577
Myxedema: See also Thyroid
bilateral, of lower parts of legs following operation for exophthalmic goiter, 313
circumscribed plaquelike type of myxedema, 133
circumscriptum tuberosum planum symmeticum crurum in exophthalmic goiter, 580
localized, 478

Nagle, N.: Kahn reaction in group of college students, *21
Nails: See also Paronychia
hereditary prolongation of lumulae of nails, 452
onychauxis, 452
onychogryposis, 304
onychomycosis affecting all nails of fingers and toes, 747
pachyonychia congenita Jadassohn, variety of ichthyosis (pachyonychia ichthyosiformis) involving chiefly nails, *218
pigmented mycotic growth beneath nail, *186
psoriasis, 148
Necrobiosis lipoidica diabeticorum, 299, *796, 897, 898
Neoarsphenamine: See Arsphenamine
Nervous System, Syphilis: See Syphilis
Netherton, E. W.: Late nodular ulcerative syphilid of arm and hand associated with elephantiasis of lower lip, 720
Resistant secondary syphilis and pregnancy, 721
Neuraxitis: See Encephalitis
Neurinoma, origin and nature of pigmented nevi (schwannomas), *779
Neuritis, clinical arsenical myelitis and neuritis due to acetarsone; report of 2 cases with 1 death; negative observations at necropsy, 855
multiple; polyneuritis following neoarsphenamine therapy, report of case with associated exfoliative dermatitis, *251
Neurocutaneous Syndrome: See under Skin
Neurofibromatosis, in 4 members of 1 family, 743
nevus multiplex Pringle and morbus Recklinghausen, 273
Recklinghausen's neurofibromatosis, (neurocutaneous syndrome) *211
Neurosyphilid of Unna as manifestation of congenital syphilis; forme fruste of late cutaneous syphilis, *561
Neurosyphilis: See Syphilis
Nevus, comedo nevus, 276
flammeus nuchae, its occurrence and abnormalities, 108
generalized, 468
multiple, 292
multiple disseminate pigmented nevi, 879
multiplex Pringle and morbus Recklinghausen, 273
Nevus—Continued
of left shoulder, 483
origin and nature of pigmented nevi (schwannomas), *779
pilosus pigmentosa congenita, its skin responses to drugs, 578
sebaceus (Jadassohn), 896
sebaceus linearis, 167
New-Born: See Infant, New-Born
Nickel, clinical spectroscopy, quantitative retention of nickel in psoriasis; observations on 46 cases, *697
Nicolas-Favre's Disease: See Lymphogranuloma inguinale
Nodules, cutaneous rheumatic nodules, *377
juxta-articular nodes, 739
Milker's: See Cowpox
Nomland, R.: Acrodermatitis chronica atrophicans with macular atrophic lesions on body, 139
Amyloidosis (localized lichen) of skin, 286
Epithelioma (basal cell) of ear of Negress, 478
Hematogenous cutaneous tuberculosis (sarcoid) in Negroes, report of 6 cases, *59
Parapsoriasis, 475
Pityriasis rubra pilaris, 284
Pseudoxanthoma elasticum of skin; angioid streaks of retina; old chorioretinitis, 280
Scleroderma, generalized, with calcification, 279
Syringoma, 475
Norris, C. B.: Request for suggestions as to therapy, 722
Nose, argyrosis of nasal mucosa, 717
lupus vulgaris of nose and multiple sarcoid of arms, 911
viable Leishmania Donovani in nasal and oral secretions of patients with kala-azar and bearing of this finding on transmission of disease, 711

Obermayer, M. E.: Eczematoid psoriasis, 135
Oberndorf, C. P.: Psychogenic aspects of disease of skin, (introductory remarks), 880
OBITUARIES:
Post, Abner, 104
Ravogli, Augustus, 574
Occupational Diseases: See Industrial Diseases
Oliver, E. A.: Ectodermal defect, 289
Idiopathic atrophy with poikiloderma-like changes or mycosis fungoides, 287
Lymphoblastoma, 278
Morphea and scleroderma of hands, 474
Oliver, E. L.: Scleroderma (circumscribed), 328
Trichotillomania, 326
Omens, D. V.: Syringoma, 475
Onchocerciasis, cutaneous, in Simulium damnosum-infected region in Uganda, 270
Onychauxis: See Nails
Onychia; Onychogryphosis; Onychomycosis; See under Nails
Orange handlers, Mucor paronychia in, *651
Oriental Sore: See Leishmaniasis
Ormsby, O. S.: Lupus miliaris disseminatus faciei, 137, 290
Parapsoriasis lichenoides, 291
Oroya fever, case of verruca peruana, 582
Osteitis, clinical study of periostitis and ostitis in early stage of frambesia, 585
tertiary syphilis, gummas of skin, hepatitis, splenomegalia, hemiplegia and osteitis of right humerus, 719
tuberculosa multiplex cystica with sarcoid and involvement of hilar nodes, 583
Osteopoikilosis: See Osteosclerosis fragilis
Osteosclerosis fragilis; dermatofibrosis lenticularis disseminata and osteopoikilosis, *552
Oulmann, L.: Lymphogranuloma inguinale with penile initial lesion, 161

Pace, E. R.: Argyria, 297
Keratoderma blenorrhagicum, 291, 757
Leprosy, 141
Tularemia or sporotrichosis, 299

Pachyonychia: See Nails
Paget's Disease of Nipple: See under Breast
Palate, fibrosis (papular) of palate; elephantiasis of upper lip, 294
progressive ulcerative reticulosis of palate, 270
Palsy: See Paralysis
Paraffin, in dermatology, 715
variegata, 755
with changes due to arsenic? 296
Paralysis: See also Hemiplegia
general, 578
general; significance of American distribution of tabes and paresis, 267
juvenile paresis, 482
Parapsoriasis, 475
en plaques, 597, 738
lichenoides, 291, 897
varioliformis acuta, 152
varioliformis, Mucha-Habermann syndrome, critical study with report of case, *631
Paratyphoid-typhoid A and B vaccine in treatment of some skin diseases, 859
Paronychia, Mucor paronychia, *651
Parounagian, M. B.: Dermatitis artefacta, 603
Dermatitis herpetiformis and epithelioma, 602
Epithelioma of glans penis, 160
Leukoplakia, 323, 604
Superficial flat epithelioma of skin, 159
Syphilis, 605
Patch tests, acneform responses to patch tests; follicular and papulopustular reactions to selectively pilosebaceous irritants, *566
Peck, S. M.: Fox-Fordyce disease, 317
Hyperpigmentation and depigmentation following recurrent erythema multiforme-like eruptions, 315
Pellagra in Sudan, 859
treatment with certain preparations of liver, 576
Pemphigus, 148, 587
acute, 125
acute, report of case occurring in granulocytopenia, *704
chronicus et vegetans, therapy of, by Bayer 205, 111
evidence in support of bacteremia as explanation of certain terminal changes in blood picture, *22
extensive pemphigoid eruption in infant, 588, 750
Senear-Usher syndrome, 896
specificity of streptococcus isolated from patients with pemphigus, preliminary report, *611
vegetans, 114, 159
vulgaris, treatment of pemphigus vulgaris and pemphigus chronicus recidivans (morbus Duhring) with Bayer 205, 450
Penis, balanitis xerotica obliterans post operationem, 717
epithelioma of glans penis, 160
erythroplasia of glans penis (Queyrat), *647
lymphogranuloma inguinale with penile initial lesion, 161
Periadenitis: See under Lymph Nodes
Perineum, resection of sensory nerves of, in kraurosis, leukoplakia and pruritus vulvae, 80
Periostitis, clinical study of periostitis and ostitis in early stage of frambesia, 585
Perlstein, M. O.: Chronic superficial ulceration of scalp, 479
Iodide eruption, erythema nodosum type, 477
Lichen nitidus, report of generalized case, *790
Pernio, disseminated lupus erythematosus with pernio, 145
Perspiration: See under Sweat and Sweat Glands
Petersen, W. F.: American distribution of deaths from cancer of skin, mouth and breast, *425
Phillips, H. T.: Erythema induratum, 455
Pigmentation achromia parasitaria, 119, 749
arsenic, 316
arsenic and lead, 314
Pigmentation—Continued
chronic pigmentation and dermatitis of neck, 587
hyperpigmentation and depigmentation following recurrent erythema multiforme-like changes, 315
influence of pigmentation due to light treatment on eruption of measles, 109
melanosis of colon due to bismuth, 860
pigmented mycotic growth beneath nail, *186
postinflammatory melanosis following bites by Cimex lectularius or urticaria pigmentosa? 756
Pillsbury, D. M.: Dextrose and water content of normal and of inflamed skin, *489
Pink Disease: See Acrodynia
Pinkus, H.: Generalized moniliasis and monilids? 741
Pityriasis, acute and chronic lichenoid pityriasis, 115
circinata Toyama, case of, 584
Devergie-Besnier, etiology of, 114
lichenoides acuta, 472
lichenoides acuta et varioliformis, 115, 119, 300, 737
rosea, arsphenamine dermatitis resembling pityriasis rosea, *415
rosea, nature of, 581
rubra (Devergie's disease), 754
rubra pilaris, 284, 460, 581
rubra pilaris or keratoma palmare et plantare, 460
Placenta, passage of arsenic through human placenta following arsphenamine therapy, 268
Plaster-of-paris cast, sensitization dermatitis on legs due to plaster-of-paris cast, 120
Plica Neuropathica: See under Hair
Plummer, F. V.: Amyloidosis (localized lichen) of skin, 286
Malignant erythroderma; aleukemic leukemia (lymphatic), 278
Plunkett, O. A.: Mucor paronychia, *651
Poikiloderma atrophicans vasculare, 170
chronic pigmentation and dermatitis of neck (poikiloderma?), 587
idiopathic atrophy with poikiloderma-like changes or mycosis fungoides? 287
Poison Ivy: See Rhus
Polyneuritis: See Neuritis, multiple
Porokeratosis: See Keratosis
Potassium mercuric iodide, dermatitis due to, *76
Pregnancy, resistant secondary syphilis and pregnancy, 721
syphilis and pregnancy, 268
Prinzmetal, M.: Nitrites for relief of pruritus, *843
Proteose in Urine: See Urine, proteose
Prurigo nodularis, 470
Pruritus, kraurosis, leukoplakia and pruritus vulvae; correlation of clinical and pathologic observations with studies regarding resection of sensory nerves of perineum, *80
nitrites in, *843
eudopelade: See Alopecia
eudoxanthoma elasticum and associated purpura with angioid streaks, 280
elasticum, case with tuberculoid granulation tissue, 864
elasticum of skin; angioid streaks of retina; old chorioretinitis, 280
Psoriasis, 303, 870
arthropathica, 303
as allergic condition, 580
clinical spectroscopy, quantitative retention of nickel in psoriasis; observations on 46 cases, *697
eczematoid, 135
liver therapy, 581
mucocutaneous surface and vermilion of lips, 599
of nails, 148
of palms and soles following attack of arthritis, 906

Psoriasis—Continued
pustulosa, 161, 458
tympanic membrane, 274
unilateral acrodermatitis chronica atrophicans associated with psoriasis, 877
vesicular, 311
Psychogenic Aspects of Skin Diseases: See under Skin
Purpura annularis telangiectodes, 277, 471
pseudoxanthoma elasticum and associated purpura with angioid streaks, 280
Pustulosis, Acute Vacciniform: See Pyodermia
Pyodermia, 591
etiology of pustulosis vacciniformis acuta (Kaposi-Juliusberg), 715
Kaposi's varicelliform eruption, 711, 712
serpiginous ulcerating pyodermia (pyodermia gangrenosa), 875
staphylogenes sudipora, 118
superficial pustular folliculitis of new-born, *257

Quinlan, R. V.: Dermatologic examination: candidate's impression, *439

Racemose livedo, 895
Radiodermatitis: See Roentgen Rays, toxicity
Radium Therapy: See under names of various diseases
Rattner, H.: Lichenoid sarcoid, 469
Parakeratosis variegata with changes due to arsenic, 296
Pityriasis lichenoides et varioliformis (acuta), 300
Tuberculosis verrucosa cutis, 476
Recklinghausen's Disease: See Neurofibromatosis
Rein, C. R.: Value of Kline precipitation test for detection of syphilis in applicants for life insurance, *190
Rendu-Osler's Disease: See Telangiectasis
Resinol ointment, erythema toxicum following application of resinol ointment, 750
Reticulo-endothelial system, function of antibody production in reticulo-endothelial system in experimental syphilis of rabbits, 718
progressive ulcerative reticulosis of palate, 270
Retina, angioid streaks, pseudoxanthoma elasticum and associated purpura with angioid streaks, 280
angioid streaks: pseudoxanthoma elasticum of skin: old chorioretinitis, 280
Retinochoroiditis, pseudoxanthoma elasticum of skin: angioid streaks of retina; old chorioretinitis, 280
Rheumatic fever, cutaneous lesions in, 855
Rheumatism, cutaneous rheumatic nodules, *377
hemorrhagic eruption of mouth and throat in rheumatic state, 266
Rhinoscleroma at necropsy, 272
histopathology of, 273
intestinal, 274
Rhus poisoning: dermatitis venenata from Rhus toxidodendron, report of unusual cases, *645
poisoning, sensitization of guinea pigs to poison ivy, 857
Riddell, W. R.: Old French poem on syphilis and its proper treatment, *11
Ritter's Disease: See Dermatitis exfoliativa
Roberts, F. W.: Cutaneous leishmaniasis, report of 2 cases, *401
Robinson, L. B.: Bilateral myxedema of lower parts of legs following operation for exophthalmic goiter, 313
Robinson, S.: Cavernous lymphangioma, 733
Roentgen Rays, centering and measuring device for roentgen therapy, *570
dosage of roentgen rays in dermatology in R units, 715
roentgen telangiectasia treated with carbon dioxide snow, 154
superficial intra-oral application of roentgen rays, *793
Therapy: See under names of diseases
toxicity; radium dermatitis, Darier's disease with fatal radium dermatitis, *412
Roentgen Rays—Continued
toxicity; roentgen ray dermatitis, 901
unit in dermatology, *761
Ronchese, F.: Dermatitis venenata from Rhus toxidodendron, report of unusual cases, *645
rosacea complex and Demodex folliculorum, 572
rosacea-like tuberculid, 892
Rosen, I.: Granuloma annulare or sarcoid, 867
Granuloma or lichen nitidus, 865
Leukoderma psoriaticum, 157
Lupus erythematosus with bullous lesions, 752
Lymphoblastoma, 320
Parapsoriasis en plaques, 597
Vesicular psoriasis, 311
Rosenberg, W. A.: Cutaneous rheumatic nodules, *377
Rosenthal, T.: Early nineteenth century dermatology and brothers Mahon, *245
Ross, E.: Pemphigus, evidence in support of bacteremia as explanation of certain terminal changes in blood picture, *22
Rostenberg, A.: Herpes gestationis, 736
Sarcoid (Darier-Roussy's type)? 463
Rubenstein, M. W.: Folliculitis decalvans, 454

Sachs, W.: Phagedenic ulcer of unknown origin, 156
Sarcoid, Boeck's, 447
Boeck's (benign miliary lupoid) and tuberculin anergy, 857
Boeck's, etiology of, 116
Darier-Roussy's type, 463, 593, 731
disseminated miliary papular lupoid, 892
hematogenous cutaneous tuberculosis (sarcoid) in Negroes, report of 6 cases, *59
lichenoid, 469
lupoid lesions of skin with active tuberculous foci, 893
lymphogranuloma or sarcoid? 310
multiple benign sarcoid of skin, 327
multiple, of arms and vulgaris, 911
or granuloma annulare, 867
or leprosy? 312
osteitis tuberculosa multiplex cystica with sarcoid and involvement of hilar nodes, 583
Sarcoma, Kaposi's hemorrhagic sarcoma, 282, 462, 477
Kaposi's, in woman, 748
Kaposi's, multiple, hemorrhagic, 748
Kaposi's; multiple idiopathic hemorrhagic sarcoma of Kaposi, report of case in American Negro, *706
Kaposi's; multiple idiopathic hemorrhagic sarcoma (Kaposi) with lesions in mouth, 153
Kaposi's; multiple pigmented hemorrhagic sarcoma of Kaposi, 742
Kaposi's; sarcoma idiopathicum multiplex haemorrhagicum (Kaposi), variations from usual clinical picture, *363
lupus sarcoma, 580
multiple giant cell sarcoma, benign type, 745
multiple giant cell sarcoma of epulis type, 865
Satenstein, D. L.: Bowen's precancerous dermatosis, 319
Phagedenic ulcer of unknown origin, 156
Sayer, A.: Charcot joint, 744
Keratoma palmare et plantare or pityriasis rubra pilaris? 460
Tinea capitis (3 recurrences after treatment) and trichophytids, 739
Scabies, treatment, 109
Scalp, chronic superficial ulceration, 479
cutis verticis gyrata (congenital anomaly type), 302
lymphoblastoma, 601
Scar: See Cicatrix
Scarlet fever, lupus erythematosus acutus disseminatus simulating scarlet fever, 900
Schaerrer, H.: Neurosyphilid of Unna as manifestation of congenital syphilis: forme fruste of late cutaneous syphilis, *561

Schamberg's progressive pigmentary dermatosis or dermatitie lichénoide purpurique et pigmentée of Gougerot and Blum, 873
Scheer, M.: Alopecia cicatrisata? 159
Follicular lesions in vitamin A and C deficiencies, *177
Lupus erythematosus (telangiectatic type) or dermatitis medicamentosa (gold), 322
Schilder, P.: Psychophysiology of skin, 883
Schizosaccharomyces: See under Fungi
Schmitt, C. L.: Melanoma with carcinomatous nodules, 457
Stomatitis and dermatitis factitia, 452
Schoch, A. G.: Arsphenamine dermatitis, attempted sensitization to neoarsphenamine and observations on patch test, *672
Scholtz, M.: Acne varioliformis, 156
Mucha-Habermann syndrome (parapsoriasis varioliformis), critical study with report of case, *631
Scirrhous carcinoma of breast, 155
Sebaceous adenoma or benign cystic epithelioma, 155
Schorr, H.: Purpura annularis telangiectodes, 471
Schüller-Christian Syndrome; lipoids and lipoid diseases; xanthomatosis (Schüller-Christian's type), 710
xanthomatosis (Schüller-Christian syndrome), report of case with necropsy, 265
Schwannoma: See Neurinoma
Schwartz, H. J.: Acanthosis nigricans, 878
Erythroplasia of Queyrat, 594
Psoriasis, 870
Pyodermia, 591
Sclerema: See Scleroderma
Sclerodactylia: See Scleroderma
Scleroderma, 168, 580
acrodermatitis chronica atrophicans in relation to scleroderma, 276
and chronic arsenic poisoning, 727
and morphea of hands, 474
circumscribed, 328
clinical investigation and pathologic histology of endocrine glands in scleroderma, 581
dermatomyositis and diffuse scleroderma, differential diagnosis and reports of cases, *227
generalized, 740
generalized, progressive, 747
generalized, with calcification, 279
sclerema-like changes in skin, 860
Scleroma: See Rhinoscleroma
Sclerosis, Bourneville's tuberous sclerosis (neurocutaneous syndrome), *211
Scorbutus: See Scurvy
Scrofuloderma: See Tuberculosis
Scull, R. H.: Epithelioma (basal cell) of ear of Negress, 478
Prurigo nodularis, 470
Syringoma, 475
Scurvy, follicular lesions in vitamin A and C deficiencies, *177
Sebaceous glands, acneform responses to patch tests; follicular and papulopustular reactions of selectively pilosebaceous irritants, *566
Secretions, Internal: See Endocrine Glands
Senear, F. E.: Case for diagnosis, 293
Hemangiomas in lipomatosis, 142
Melanoma, 297
Parakeratosis variegata with changes due to arsenic? 296
Plica neuropathica, 301
Purpura annularis telangiectodes, 471
Sarcoid, lichenoid, 469
Senear-Usher Syndrome: See Pemphigus
Shampoos, dermatitis produced by hymolal salts (new soaplike material), *517
Silk handler's disease of skin, 586
Silver, H.: Hyperpigmentation and depigmentation following recurrent erythema multiforme-like eruptions, 315
Melanocarcinoma, 462
Silver; argyria, 297
argyrosis of nasal mucosa, 717
Skin, alkali reserve in some cases of dermatosis with regard to seasonal variations, 114
Atrophy: See Atrophy
Cancer: See Cancer
circulation, cutaneous, in light of high magnification capillaroscopy, 444
colloid degeneration; pseudocolloid milium, 724
dermatosis papulosa nigra, 166
dextrose and water content of normal and of inflamed skin, *489
Diseases: See also Dermatitis; and under names of disease, as, Eczema; Herpes; Mycosis; etc.
diseases, results of use of typhoid-paratyphoid A and B vaccine in treatment, 859
elastic tissue; lipoid imbibition of degenerate elastic tissue, 586
fluorescence of elastic fibers of skin, 445
glycogen and metabolism of sugar in skin, 447
hyperelasticity; Danlos syndrome associated with congenital lipomatosis, *540
indurations in new-born, experimental, 712
influence of psyche on skin, 881
influence of skin on psyche, 881
neurocutaneous syndrome, 126
neurocutaneous syndrome; congenital ectodermoses, *211
neurotic excoriations, 882
papular urticaria and dynamics of skin sensation, 270
psychogenic aspects of diseases of skin, 880, 881
psychophysiology of skin, 883
self-disinfecting power of skin, 576
sugar storage in skin in hunger, 447
treatment of commoner inveterate diseases of skin, 270
Tuberculosis: See Tuberculosis
Smallpox, modification of vaccination by therapeutic means, 713
Soap mixture; new cleansing cream, *243
dermatitis produced by hymolal salts (new soaplike material), *517
Societies, dermatologic, directory of, 174, 334, 486, 608, 758, 914
foreign, directory of, 174, 334, 486, 608, 758, 914
International Congress of Dermatology and Syphilology, Ninth, 484
international, directory of, 174, 334, 486, 608, 758, 914
local, directory of, 175, 335, 487, 609, 759, 915
national, directory of, 174, 334, 486, 608, 758, 914
sectional, directory of, 174, 334, 486, 608, 758, 914
state, directory of, 175, 335, 487, 609, 759, 915

Society Transactions:
American Dermatological Association, 865
Bronx Dermatological Society, 459, 734
Chicago Dermatological Society, 135, 468, 754
Cleveland Dermatological Society, 719
Dermatological Conference of Mississippi Valley, 278
Detroit Dermatological Society, 162
Los Angeles Dermatological Society, 154, 726
Manhattan Dermatologic Society, 156, 317, 601, 751
Minnesota Dermatological Society, 117, 302, 892
New England Dermatological Society, 325
New York Academy of Medicine, Section of Dermatology and Syphilology, 144, 308, 596
New York Academy of Medicine, Section of Neurology and Psychiatry and Section of Dermatology and Syphilis, 880
New York Dermatological Society, 164, 587, 745, 901
Philadelphia Dermatological Society, 122

Society Transactions—Continued
Philadelphia Pediatric Society and Philadelphia Dermatological Society, 480
Pittsburgh Dermatological Society, 452
Sohrweide, A. W.: Recent changes in dermatologic diagnosis, résumé of 1,112,050 published cases, *260
Spectroscopy, clinical spectroscopy, quantitative retention of nickel in psoriasis; observations on 46 cases, *697
clinical spectroscopy; study of biopsy material from patients who had received intravenous injections of silver arsphenamine, *433
Spiegel, L.: Glossitis rhombica mediana, 465
Gumma of tongue with carcinomatous degeneration? 464
Lupus erythematosus with lesions in mouth, 463
Spinal Puncture and Hinton test in treated primary and secondary syphilis, *813
safety of lumbar puncture for ambulatory patients, *692
Spinner, G. J.: Lymphangitis, 461
Multiple pigmented hemorrhagic sarcoma of Kaposi, 742
Spirochaeta pallida, experimental yaws in mice: Spirochaeta pallida in iliac lymph glands, 585
pallida, high pathogenicity of recently isolated strain, *847
single cell inoculations with Treponema pallidum, 442
use of alcoholic suspensions of Spirochaeta pallida for serologic diagnosis of syphilis, 717
Spitz, J.: Urticaria in relation to weight, 854
Spleen, spirochetes in lymph glands of syphilitic rabbits; fluctuation in spirochete content of spleen, 584
spirochetes in spleen and lymph glands of syphilitic rabbits after insufficient treatment with salvarsan, 275
Splenomegalia, tertiary syphilis, gummas of skin, hepatitis, splenomegalia, hemiplegia and osteitis of right humerus, 719
Sporotrichosis or tularemia, 299
Staphylococcus infection, treatment of superficial staphylococcal infection by toxoid, 443
Staud, A. H.: Clinical spectroscopy, quantitative retention of nickel in psoriasis; observations on 46 cases, *697
Clinical spectroscopy, study of biopsy material from patients who had received intravenous injections of silver arsphenamine, *433
Steele, C. W.: Lupus erythematosus disseminatus cutus haemorrhagicus, *772
Stein, I.: Tuberculosis, 734
Stiles, F., Jr.: Erythroplasia of glans penis (Queyrat), *647
Stillians, A. W.: Esthiomene, probably lymphogranulomatosis inguinalis, 142
Fibrosis (papular) of palate; elephantiasis of upper lip, 294
Stokes, J. H.: Dermatitis herpetiformis, 131
Infantile acne, 134
Stomach, disturbances secondary to syphilitic infections, 577
Stomatitis and dermatitis factitia, 452
hemorrhagic and ulceromembranous cervicovaginitis with accompanying stomatitis in course of bismuth therapy, 109
ulcerative vulvitis and stomatitis, 472
Stovarsol: See Acetarsone
Strauser, E. R.: Acrodermatitis chronica atrophicans with macular atrophic lesions on body, 139
Strauss, M. J.: Dermatitis due to potassium mercuric iodide, *76
Streptococci, specificity of streptococcus isolated from patients with pemphigus, preliminary report, *611
Sugar and glycogen metabolism of sugar in skin, 447
storage in skin in hunger, 447
Sulphotreparsenan, sudden onset of hemorrhagic diathesis after treatment with Sulphotreparsenan, 447
Sulphur, mycotic dermatitis of hands and feet with contact dermatitis due to sulphur, 120
Sulzberger, M. B.: Acneform responses to patch tests; follicular and papulopustular reactions to selectively pilosebaceous irritants, *566
Generalized moniliasis and moniliids, 741
Tuberculosis? 734
Suskind, F. H.: Lymphogranuloma inguinale; preservation of Frei antigen by drying; its concentration in fresh and in dried pus, *823
Sutherland-Campbell, H.: Common warts; effective treatment, *821
Mucor paronychia, *651
Roentgen telangiectasia treated with carbon dioxide snow, 154
Sutton, R. L., Jr.: Rare sweat gland tumor: syringocystadenoma nodularis, *195
Sweat and Sweat Glands, circumscribed facial hyperhidrosis, 583
sweat gland functioning in spots of leprosy, 275
tumor, rare sweat gland tumor: syringocystadenoma nodularis, *195
Sweitzer, S. E.: Achromia parasitaria, 119
Eczema due to food, 120
Fixed eruption due to bismuth, 306
Mycotic dermatitis of hands and feet with contact dermatitis due to sulphur, 120
Naevus sebaceus (Jadassohn), 896
Parapsoriasis lichenoides, 897
Racemose livedo, 895
Sensitization dermatitis on legs due to plaster-of-paris cast, 120
Sycosis, treatment of sycosis and allied follicular infections of skin, 109
Syphilid, flat papular syphilid with unusual coalescence, 879
late nodular ulcerative syphilid of arm and hand associated with elephantiasis of lower lip, 720
Syphilis: See also Chancre; Spirochaeta pallida; and under names of organs and regions, as Bladder, syphilis; etc.
albuminuria in, 267
blood cytology in experimental syphilis, period of disease latency, 711
blood cytology in untreated and treated syphilis, 108
blood transfusion as cause of syphilis, 480
case for diagnosis, 123, 605
Charcot's knee joint in, 600
congenital, 579
congenital, acetarsone in comparison with bismuth therapy, 856
congenital, cutaneous diphtheria in, report of case, *207
congenital; does treatment of congenital syphilis prevent development of interstitial keratitis? interstitial keratitis after injury, 716
congenital, in child showing repeated signs of activity which subsided with specific treatment, 579
congenital; involvement of central nervous system, 720
congenital, late, results of treatment in 267 patients, 267
congenital; polymorphous hereditary syphilitic lesions of eye observed in 3 brothers, 110
congenital, teeth in, 715
dermatitis herpetiformis in syphilitic patient, 753
diagnosis; efficiency of gold sol and mastic tests in syphilitic conditions, 444
diagnosis from dried drop of blood, 716
experimental; function of antibody production in reticulo-endothelial system in experimental syphilis of rabbits, 718
experimental; single cell inoculations with Treponema pallidum, 442

Syphilis—Continued
experimental yaws; comparison of infection with experimental syphilis, 268
extragenital, in child 3 years old, 726
fluctuation of sugar content in serum of syphilitic patients, 115
French poem on syphilis and its proper treatment, *11
gastric disturbances secondary to syphilitic infections, 577
generalized lupus vulgaris in syphilitic patient, 321
Hereditary: See Syphilis, congenital
Hinton test and lumbar puncture in treated primary and secondary syphilis, *813
histologic changes in clinically unaltered skin in syphilis, 110
immunity in syphilis of rabbits, 111
immunity, passive, to syphilis in rats, 585
jaundice in, 441
Kahn reaction in group of college students, *21
Kline precipitation test for detection of syphilis in applicants for life insurance, value of, *790
late secondary syphilis, 596
luetin, value of organic luetin in diagnosis and treatment of syphilis, study of 900 cases, *676
malignant syphilis with grave involvement of mucous membranes of mouth, 276
Meinicke second flocculation test (Meinicke clarification reaction II), 448
metastatic keratitis parenchymatosa in syphilitic rabbits; distribution of Spirochaeta pallida in early stage, 584
neurosyphilid of Unna as manifestation of congenital syphilis, forme fruste of late cutaneous syphilis, *561
neurosyphilis, treatment with acetarsone (stovarsol) given intravenously, 267
of heart, coronary ostia and coronary arteries with reference to clinical picture presented by syphilitic stenosis of coronary ostia, 577
of heart, coronary ostia and coronary arteries with reference to myocardial lesions noted in stenosis of coronary ostia, 577
pregnancy and, 268
pregnancy and resistant secondary syphilis, 721
pseudoreinfection, 450
relapse in primary syphilis, 453
secondary, 128
serodiagnosis; use of alcoholic suspensions of Spirochaeta pallida for serologic diagnosis, 717
spirochetes in lymph glands of syphilitic rabbits, 275
spirochetes in lymph glands of syphilitic rabbits; fluctuation in spirochete content of spleen, 584
spirochetes in spleen and lymph glands of syphilitic rabbits after insufficient treatment with salvarsan, 275
syphilitic infiltration of face simulating lupus erythematosus, 735
tertiary, 465
tertiary; aneurysm of right innominate artery, 723; correction, 913
tertiary; gummas of skin, hepatitis, splenomegalia, hemiplegia and osteitis of right humerus, 719
tertiary, of lung, 863
tertiary; request for suggestions as to therapy, 722
thyroid function, disturbances of, 446
Treatment: See also Arsphenamine; Bismuth; etc.
treatment; acetarsone in Negro children, 855
treatment of neurosyphilis with acetarsone (stovarsol) given intravenously, 267
treatment of resistant somatic syphilis, *1
treatment; quantitative clouding reactions (Trübungsreaktionen) as measurement of progress of therapy in syphilis, 591
treatment; request for suggestions as to therapy, 722
Syphilis—Continued
treatment; therapeutic results of syphilose in syphilitic rabbits, 718
treatment with colloidal mercury sulphide, *49
treatment with spirochete vaccine, 861
tuberculosis and syphilis, simultaneous occurrence, 274
Syphiloderm: See Syphilid
Syphiloma: See Gumma
Syphilose, therapeutic effect, 864
therapeutic results of syphilose in syphilitic rabbits, 718
Syringocystadenoma nodularis, rare sweat gland tumor, *195
Syringoma, 475, 896

Tabes, Charcot joint, 600, 744
significance of American distribution of tabes and paresis, 267
Talalov, J. Z.: Ulcus vulvae acutum accompanied by disease of skin and of oral mucosa, *510
Tattooing, chemical method of corneal tattooing for production of brown color, 271
psychologic motives in tattooing, 888
Taub, A.: Hydrogen ion concentration of lotions used in acne, *6
Teeth in congenital syphilis, 715
Telangiectasia haemorrhagica hereditaria, 449
hereditary, hemorrhagic; Osler's "recurring epistaxis with multiple telangiectasis of skin and mucous membranes," 295
of feet, 730
roentgen telangiectasis treated with carbon dioxide snow, 154
Templeton, H. J.: Preparation of trichophytin, *9
Thallium poisoning, histopathologic changes in nervous system, 110
skin lesions due to, 715
Thrombosis, bilateral, of superior labial arteries with gangrene in diabetic patient, 480
Throne, B.: Scleroderma, 168
Thymus, so-called thymic hyperplasia, follow-up study of 30 cases, 266
Thyroid function, disturbances in syphilis, 446
Tick bite caused by "house-tick," 113
Tinea capitis, 3 recurrences after treatment and trichophytids, 739
Tobias, N.: Danlos syndrome associated with congenital lipomatosis, *540
Tobin, W. W.: Scleroderma, generalized, with calcification, 279
Tongue, furred tongue in general diseases, 583
glossitis rhombica mediana, 465
glossitis rhombica mediana, report of case with results of treatment, *401
glossitis syphilitica, 468
gumma of tongue with carcinomatous degeneration, 464
relationship of glossitis marginata to lymphogranulomatosis inguinalis, 445
Torbert, H. C.: Safety of lumbar puncture for ambulatory patients, *692
Traub, E. F.: Cheilitis exfoliativa, 910
Dermatosis papulosa nigra, 166
Hemolymphangioma of skin with leiomyoma of deep portion of derma and cavernous angioma, portions of which are becoming sclerosed and calcified, 869
Keratosis on lower lip in patient shown at Dec. 19, 1933, meeting, 171
Morphea, 868
Morphea-like tuberculosis cutis or morphea, 902
Pemphigus, 587
Pigmentation due to arsenic and lead, 314
Report on case diagnosed as squamous cell carcinoma on chin at Dec. 19, 1933, meeting, 170
Tuberculosis, 592
Treponema Pallidum: See Spirochaeta pallida
Trichinosis, cutaneous manifestations, 446
Trichophytids and tinea capitis (3 recurrences after tretment), 739
Trichophytin, preparation of, *9

Trichophyton interdigitale Priestly, phases of metabolism, 269
Trichotillomania: See under Hair
Tubercle Bacilli, demonstration in circulating blood by culture and animal inoculations, 273
filtrability of acid-fast group, 269
microscopic demonstration of acid-fast bacilli in tuberculous filtrates and production of tuberculous "ultravirus" infections in guinea-pigs, 269
Tuberculids: See under Tuberculosis, Skin
Tuberculin, allergy and tuberculosis of skin, 275
anergy and sarcoid of Boeck (benign miliary lupoid), 857
ointment patch test, 441
tuberculoid reaction in lymph nodes, *518
Tuberculosis, Skin, 129, 592, 734
allergy and immunity to tuberculosis, 443
erythema nodosum and tuberculosis, 265
hematogenous cutaneous tuberculosis (sarcoid) in Negroes, report of 6 cases, *59
lupoid lesions of skin with active tuberculous foci, 893
morphea-like tuberculosis cutis morphea, 902
of hypoderm, 751
or granuloma inguinale? 597
orificialis, 122
primary complex ulcer, 893
pseudoxanthoma elasticum with tuberculoid granulation tissue, 864
rosacea-like tuberculid, 892
simultaneous occurrence of tuberculosis and syphilis, 274
specific skin reaction for tuberculosis cutis and tuberculid, 717
tuberculin-allergy and tuberculosis of skin, 275
tuberculous lesions of skin with active foci, 900
verrucosa cutis, 476
Tularemia or sporotrichosis, 299
treated by new specific antiserum, 266
Tumors: See also under Cancer; Epithelioma; Sarcoma; etc.
Turnacliff, D. D.: Lupoid lesions of skin with active tuberculous foci, 893
Tuberculous lesions of skin with active foci, 900
Tylositas symmetrica pollicis et indicis, 580
Typhoid-paratyphoid A and B vaccine in treatment of some skin diseases, 858

Ulcer, atrophic ulcer in scar tissue of nose, 902
chronic superficial ulceration of scalp, 479
factitious ulcer of lip (simulating epithelioma), 126
phagedenic, of unknown origin, 156
postencephalitis trophic ulcer, *837
Rodent: See Cancer
septic, of groin, 738
tuberculous, primary complex, 893
vulvae acutum accompanied by disease of skin and of oral mucosa, *510
Umbilical cord, histologic demonstration of Schizosaccharomyces hominis in umbilical cord, 445
Urine, bismuth in modified method for quantitative determination, 863
proteose; urinary proteose in eczema, *497
transfer of activity of hydrogen ions of human urine caused by mixing of some pathogenic organisms with it, 112
Urticaria in relation to weight, 854
papular, and dynamics of skin sensation, 270
pigmentosa or drug eruption, 591
Urueña, J. G.: Darier's disease with fatal radium dermatitis, *412
Uterus, chancre of cervix, 578

Vaginitis, hemorrhagic and ulceromembranous cervicovaginitis with accompanying stomatitis in course of bismuth therapy, 109
Varicella: See Chickenpox
Varicose ulcers, treatment, 108
veins, treatment, 857
Vascular disease, heat, desiccation and oxygen in local treatment of advanced peripheral vascular disease, 576
Vero, F.: Acrodermatitis chronica atrophicans, 153
Dermatitis from cinnamon; dermatomycosis, 152
Verruca, common warts, effective treatment, *821
Peruana: See Oroya fever
review, *659
vulgaris, autolysate therapy, *44
Verrucosis, lymphostatic (mossy foot), 711
Vincent's Disease: See Angina
Vitamin A and C, follicular lesions in vitamin A and C deficiencies, *177
influence of vitamins on acute infections, 860
Vitiligo following arsphenamine dermatitis, 871
generalized posterythrodermic leukomelanodermia following treatment with acriflavine hydrochloride, 113
leukoderma psoriaticum, 157
lichen planus and vitiligo (lesions appearing in patches of vitiligo), 122
Sutton's disease and vitiligo, 115
Vulva, demonstration of Bacillus crassus in lesions in mouth in ulcus vulvae acutum, 444
ulcerative vulvitis and stomatitis, 472
ulcus vulvae acutum accompanied by diseases of skin and of oral mucosa, *510

Wakerlin, G. E.: Colloidal mercury sulphide in syphilis, *49
Wallhauser, H. J. F.: Dermatitis vegetans, 874
Walzer, A.: Disseminated lupus erythematosus with pernio, 145
Lichen planus of mouth only, 152
Lupus pernio (Besnier), 150
Multiple keloids, 147
Warts: See Verruca
Wassermann Reaction: See Syphilis
Webster, J. R.: Sarcoma idiopathicum multiplex haemorrhagicum (Kaposi), variations from usual clinical picture, *363
Weidman, F. D.: Acute pemphigus, 125
Dermatitis herpetiformis, 128
Mycosis fungoides, 123
Syphilis, 123
Tuberculid, 129
Tuberculosis cutis (orificialis), 122
Welsh, A. L.: Specificity of streptococcus isolated from patients with pemphigus, preliminary report, *611
White, C. J.: Thrombosis (bilateral) of superior labial arteries with gangrene in diabetic patient, 480
Wien, M. S.: Chronic superficial ulceration of scalp, 479
Iodide eruption; erythema nodosum type, 477
Lichen nitidus, report of generalized case, *790
Willard, L.: Hereditary prolongation of lunulae of nails, 452
Pustular psoriasis, 458
Willet, J. C.: Kahn reaction in group of college students, *21
Wilson, D. J.: Dermatomycosis and the soldier, *841
Wise, F.: Achroma parasitaria, 749
Chronic pigmentation and dermatitis of neck (poikiloderma), 587
Dermatite lichénoide purpurique et pigmentée of Gougerot and Blum or Schamberg's progressive pigmentary dermatosis, 873
Dermatitis herpetiformis (earliest stages), 907
Dermatitis herpetiformis in syphilitic patient, 753
Erythema toxicum following application of resinol ointment, 750
Extensive flat epithelioma of cheek, 912
Lupus erythematosus verrucosus, 904
Multiple hemorrhagic sarcoma of Kaposi, 748
Parapsoriasis guttata, 588
Unilateral acrodermatitis chronica atrophicans associated with psoriasis, 877
Urticaria pigmentosa or drug eruption, 591

Wise, F.—Continued
Xanthoma tuberosum multiplex in child aged 2½ years, 745
Wolf, C.: Generalized scleroderma, 740
Wolff, M. J.: Localized myxedema, 478
Nevi multiple, 292
Parapsoriasis, 475
Ulcerative vulvitis and stomatitis, 472
Wounds, influence of vitamins on acute infections, 860
Wright, C. S.: Granuloma annulare, 481
Nevus of left shoulder, 483
Unilateral acrodermatitis chronica atrophicans associated with psoriasis, 877

Xanthoma, morphea with xanthomatous infiltration, 598
nature and origin of xanthoma cell, 710
nature of so-called xanthoma, 710
tuberosum multiplex in child aged 2½ years, 745
xanthelasmatosis, 117
Xanthomatosis: See Schüller-Christian Syndrome; Xanthoma
Xeroderma pigmentosum, 751

Yaws: See Frambesia
Young, W. J.: Pigmented mycotic growth beneath nail, *186

Zakon, S. J.: Esthiomene, late manifestation of lymphopathia venerea (lymphogranulomatosis inguinalis), *831
Esthiomene, probably lymphogranulomatosis inguinalis, 142
Zeisler, E. P.: Allergic dermatitis, 138
Hemangioma cavernosum of ear; angiofibrosarcoma of neck, 283
Lentigo, generalized (systematized nevus), 468
Mycosis fungoides, 295
Necrobiosis lipoidica diabeticorum, 299, *796
Universal erythroderma with lichenification, 288
Zona: See Herpes zoster

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CONTENTS

PAGE

The Roentgen Unit in Dermatology. George M. MacKee, M.D., and Anthony C. Cipollaro, M.D., New York 761

Lupus Erythematosus Disseminatus Acutus Haemorrhagicus. Walter T. Garfield, M.D.; Charles W. Stiehl, M.D., and John D. Houghton, M.D., Boston 772

Origin and Nature of Pigmented Nevi (Schwannomas). S. Weissman Becker, M.D., Chicago 779

Granuloma Annulare: Report of an Unusual Case. Franklin H. Grauer, M.D., Ann Arbor, Mich. 785

Lichen Nitidus: Report of a Generalized Case. Max S. Weil, M.D., and Minnie Oehler Perlstein, M.D., Chicago 790

Superficial Intra-Oral Application of Roentgen Rays. Justin Hollander, M.D., and A. Fisher, M.D., Pittsburgh 793

Necrobiosis Lipoidica Diabeticorum. Erwin Paul Zeissler, M.D., and Marcus Rayner Cano, M.D., Chicago 796

Hinton Test and Lumbar Puncture in Treated Primary and Secondary Syphilis. William A. Hinton, M.D., Boston 813

Common Warts: An Effective Treatment. H. Sutherland Campbell, M.D., Los Angeles 821

Lymphogranuloma Inguinale: I. Preservation of Feet Antigen by Drying; Its Concentration in Fresh and in Dried Pus. Arthur W. Grace, M.B., D.P.H., with the Technical Assistance of Florence H. Suskind, M.Sc., New York 823

Esthiomene, a Late Manifestation of Lymphopathia Venerea (Lymphogranulomatosis Inguinalis). Maurice Dosne, M.D., and Samuel J. Zakon, M.D., Chicago 831

Postencephalitic Trophic Ulcer. Sigmund S. Greenbaum, M.D., and Bernard J. Alberts, M.D., Philadelphia 837

Dermatomycosis and Her Soldier. Donald J. Wilson, M.D., Omaha 841

Use of Nitrites for the Relief of Pruritus. Myron Prinzmetal, M.D., Boston 843

The High Pathogenicity of a Recently Isolated Strain of Spirochaeta Pallida. Chuan Kuei Hu, M.D., New York 847

Correspondence:

Urticaria in Relation to Weight. Jacob Stitz, M.D., Boston 854

Demodex Folliculorum and Acne Rosacea. William J. Macdonald, M.D., Boston 854

Abstracts from Current Literature 855

Society Transactions:

American Dermatological Association 865

New York Academy of Medicine, Section of Neurology and Psychiatry and Section of Dermatology and Syphilis 880

Minnesota Dermatological Society 892

New York Dermatological Society 901

Book Reviews 913

Directory of Dermatologic Societies 914

General Index 917